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SHARED APERTURE BREADBOARD TEST SYSTEM (SABTS) LASER SUPPORT.(U)

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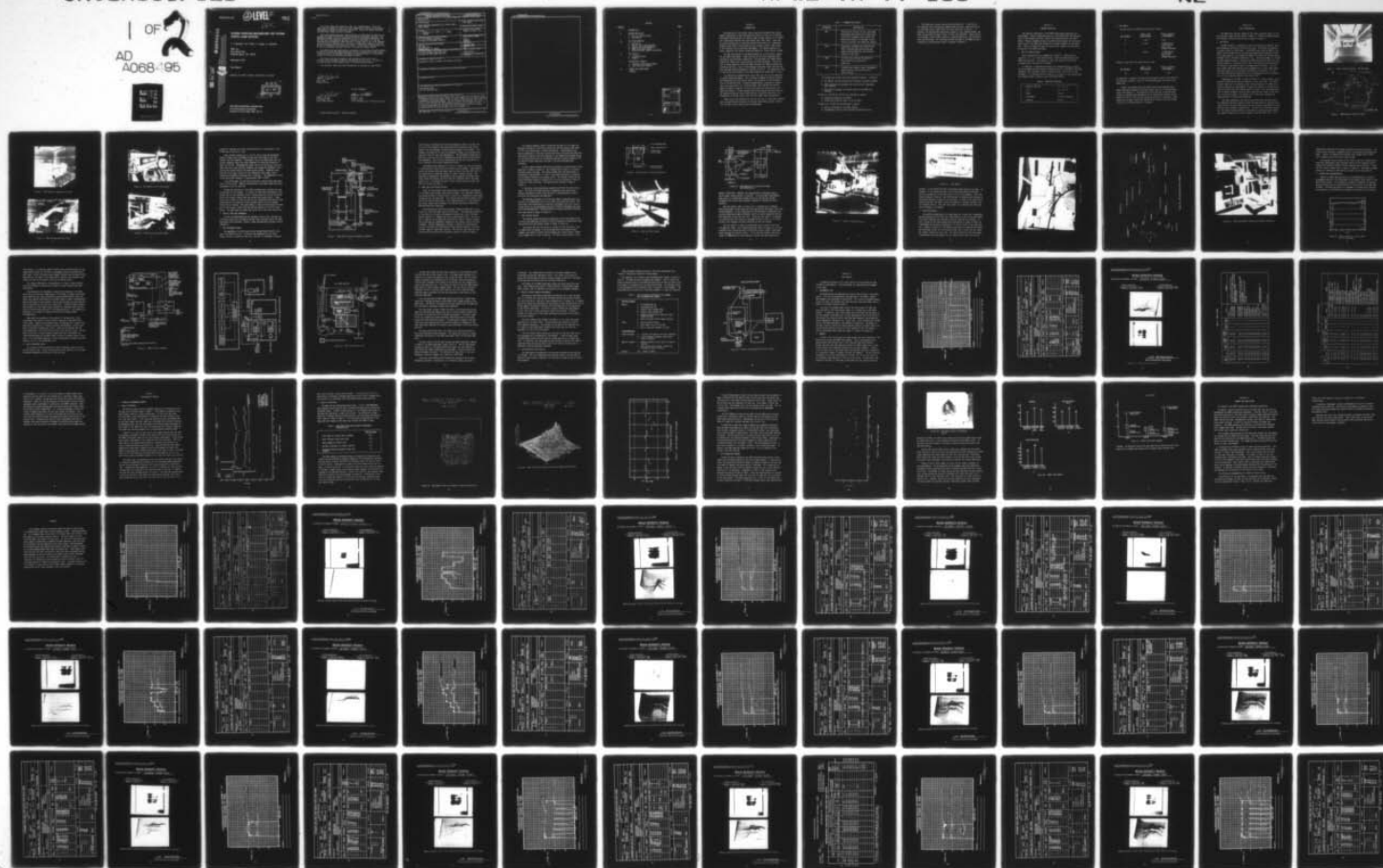
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T. V. Roszhart , W. P. Ball, J. T. Sings, J. L. Schmidt

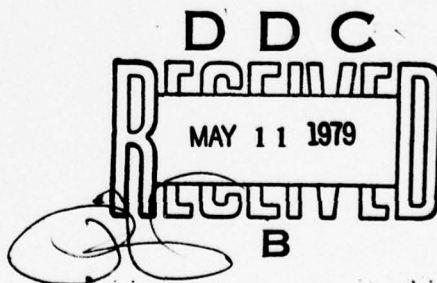
TRW, Inc.
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December 1978

Final Report

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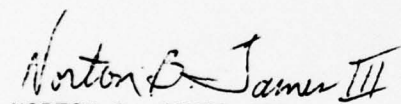
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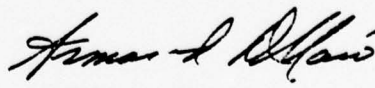
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Section I

INTRODUCTION

The objective of the overall Shared Aperture Breadboard Test System (SABTS) program was to test predicted survivability levels and to measure performance characteristics of dichroic beam splitter samples in an intense 3.8 μm deuterium fluoride (DF) high energy laser (HEL) beam. These samples were developed for an aperture sharing device which will separate an outgoing laser beam of high intensity from incoming tracker light signal of low intensity and of different wavelength. The shared aperture will reduce complexity and improve system performance of future tracker systems.

The TRW contribution to the SABTS program was to provide HEL support for the SABTS experiments. Other portions of the total experiment were provided by two additional contractors. Ford Aerospace and Communication Corporation (FACC) built and maintained the SABTS equipment. The University of Dayton Research Institute (UDRI) operated the SABTS equipment and collected test data. The Air Force Weapons Laboratory (AFWL) provided the test specimens and coordinated all testing activities. The responsibilities of the various participants in the SABTS program are summarized in table 1.

The TRW baseline demonstration laser (BDL) HEL facility was modified to accept these experiments. This involved a somewhat extensive redesign and restructuring of the optical train, and renovation of the vestibule area of the BDL building. Extensive soundproofing, painting for cleanliness, and installation of a filtered blower were required to provide a positive pressure clean-air facility with tolerable vibrations for the SABTS test tables. Further changes involved the design and fabrication of the supporting optical train, modifications to existing facilities, and integration of the BDL device into the total SABTS test configuration.

Power levels were measured for each of the runs, so that when combined with the magnification settings of the beam conditioning system, intensities incident on the samples could be determined.

Table 1. PROGRAM PARTICIPANTS

CONTRACTOR	CONTRIBUTION
TRW	Provide test facility, DF HEL laser beam, measurement and monitoring of beam power, profile and alignment, data control and monitoring signals, TV coverage, consultation on testing, and technician support.
FACC	Fabricated, assembled and installed the SABTS including beam conditioning and sample testing apparatus and continued support to the tests.
UDRI	Provided test planning and execution, data collection, analysis and reporting.
AFWL	Provided test samples, overall management, administration, and coordination of entire program.

The program was divided into three sequential phases. In Phase I:

- The TRW BDL site was modified and prepared to accept the SABTS.
- SABTS apparatus and equipment was installed and integrated with facility.
- Startup and alignment of the BDL device to the SABTS was achieved.

In Phase II, the BDL HEL facility was operated to support:

- Acceptance testing of the SABTS.
- Coating survivability tests in the HEL beam.

In Phase III, the BDL HEL was operated to support:

- Optical evaluation of the SABTS samples.
- Supplementary Effects Tests outside the SABTS test area.

The objectives of each plan were met successfully. In particular, the completed test configuration demonstrated the power, beam characteristic and beam control capabilities that were specified for Phase I. In addition, the program test objectives (number of runs, samples tested, and total lasing time) of Phase II and III were also completed. These results are outlined in the various sections on program objectives, test configuration, and test data. All raw data has been included in an appendix with a discussion of the pertinent results included in Section V.

Section II

PROGRAM OBJECTIVES

The technical objectives of the SABTS program were separated into three phases. Phase I objectives were test site preparation and configuration of the specimen test area, control and monitoring area, and laser device. Phase II objectives were to provide lasing support for the acceptance tests of the SABTS and screening of optimum coatings for the specimens. Phase III objectives were to provide laser support for the optical evaluation of the SABTS specimens.

1. FACILITY SPECIFICATION

Beam characteristics are summarized in table 2. Specifications require a $\leq 3.7 \times 3.7$ cm DF beam having at least 36 kW delivered to the SABTS area entrance. The beam was to have less than 0.75 milliradian divergence and a duration of 20 seconds.

In addition, a laboratory area was to be provided having a suitable test environment and the capacity to house portions of the SABTS, including diagnostic test equipment, optical interface table, and mirror cooling equipment. This area was to be at least 8 by 6 meters in size and provided with adequate power, lighting, and cleanliness control.

Table 2. BEAM SPECIFICATIONS

Spectral Emission	3.5 - 4.1 μ m
Size	3.7 x 3.7 cm
Power	>36 kW
Divergence	<0.075 milliradian
Duration	\approx 20 sec

2. TEST MATRIX

The test matrix for Phase II was to be as follows:

<u>No. of Runs</u>	<u>Approx. Run Time (Lasing)</u>	<u>Approx. Exposure Time/Sample</u>
2	5 sec	5 sec
8	12 sec	6 exposures of 0.25 sec each with 2 sec between exposures
4	30 sec	6 exposures of 3.0 sec each with 2 sec between exposures

Similarly, the matrix for Phase III was to be:

<u>No. of Runs</u>	<u>Approx. Run Time (Lasing)</u>	<u>Approx. Exposure Time/Sample</u>
40	5 sec	5 sec

An additional 7 seconds of lasing time was added to each of the above lasing durations (Phases II and III) for determining power delivered to the SABTS area.

A small-scale effects test was added later to the program scope. These tests were designed to run concurrently (and on a noninterference basis) with Phase III. The objective of the test was to provide laser support to determine the degradation of RF transmission through various materials with air flow over the target during laser irradiation. Other objectives included visual data from material fracture and burn-through rate data at different angles of incidence.

Section III

TEST CONFIGURATION

The SABTS test area was located in the lower vestibule section of the building that houses the BDL device (figure 1). The BDL building location with respect to other CTS facilities is shown in figure 2.

1. BDL DEVICE

The BDL system is a combustion driven, continuous wave chemical laser which produces a multiline infrared laser beam. The BDL may be operated in either a DF/HF or HF/DF mode. In the HF/DF case (used for SABTS), the atomic fluorine required for cold reaction operation was obtained by burning H_2 and excess F_2 in a combustion chamber to produce equilibrium concentrations of HF, F and small quantities of F_2 . Helium was added as a diluent to these combustor gases to increase the effective specific heat ratio and thermal capacity of the gases and to lower the effective molecular weight. All three of these effects tend to increase laser efficiency. The combustor gases were then supersonically expanded into a cavity region where they were mixed with D_2 to produce vibrationally excited DF, i.e., DF*. The laser spectrum was centered near 3.8 μm wavelength which is characteristic of the vibration-rotation transitions of DF*.

A photograph of the BDL is shown in figure 3. Figure 4 shows a cross-sectional view with the various reactants in the flow field. The cavity injector consists of six modules, each 4-inches high and 10-inches long. Figure 5 shows the six BDL modules in place and figure 6 is a view of the front of the BDL with one injector nozzle in place. This configuration of the six modules produces an active gain cross section, normal to the flow axis, of 4 by 60 inches. The optical axis of the laser resonator was placed parallel to the 60-inch dimension.

The copper combustors and nozzles were cooled with deionized water. The combustor and nozzle coolant system are pump-fed due to the high flow rates (36 and 144 gpm, respectively) and low pressure requirements (45 and 150 psia inlet pressure, respectively). The low cavity pressure required for satisfactory laser operation is obtained by a two-stage steam condenser ejector system used as a pump system for the BDL laser flows. The

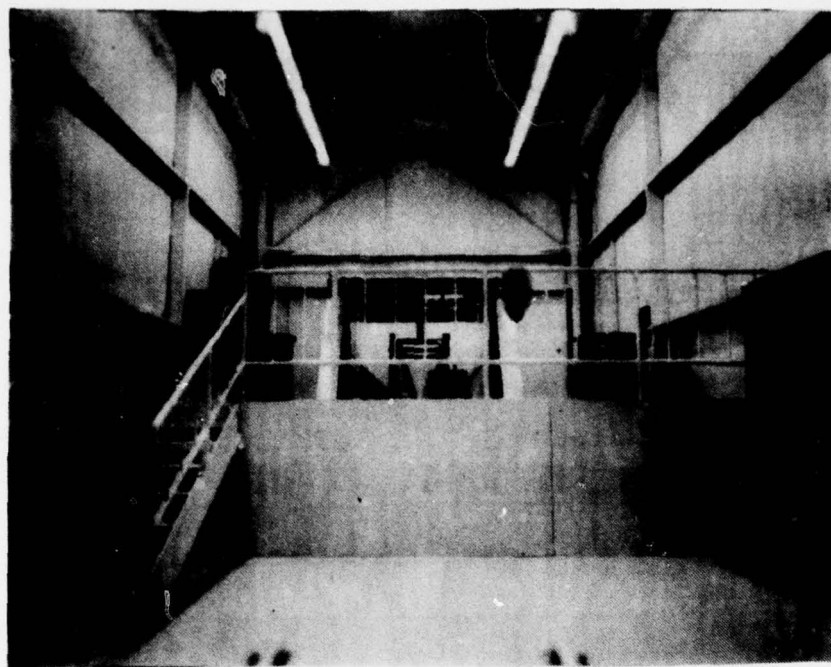


Figure 1. Lower Vestibule Section - BDL Building

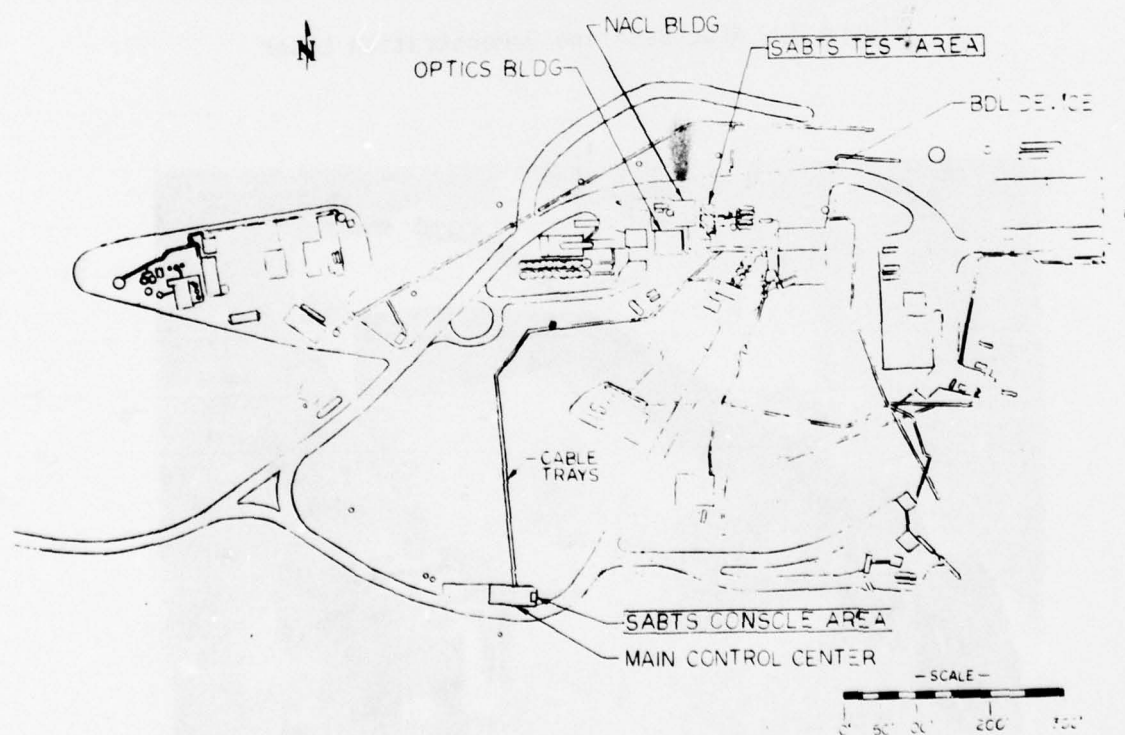


Figure 2. SABTS Overall Area (CTS Site)

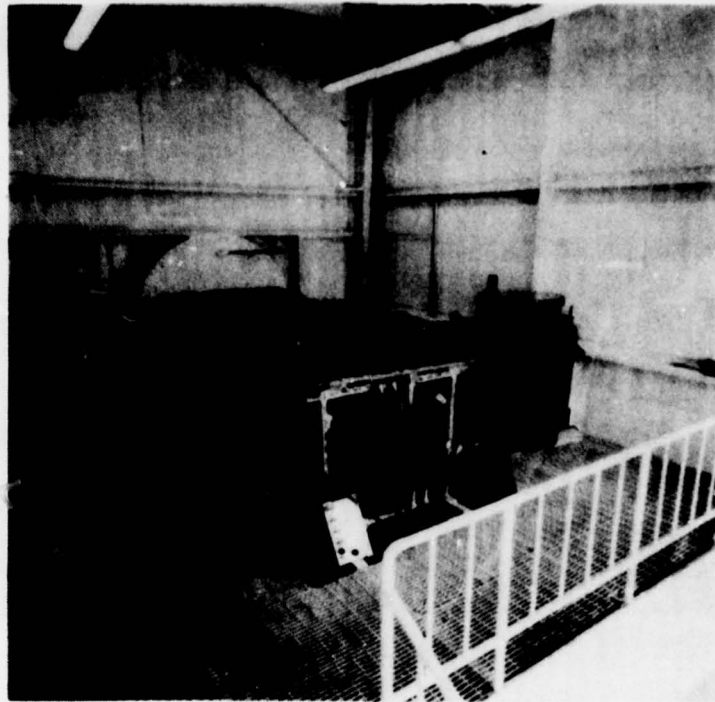


Figure 3. AFWL Baseline Demonstration Laser

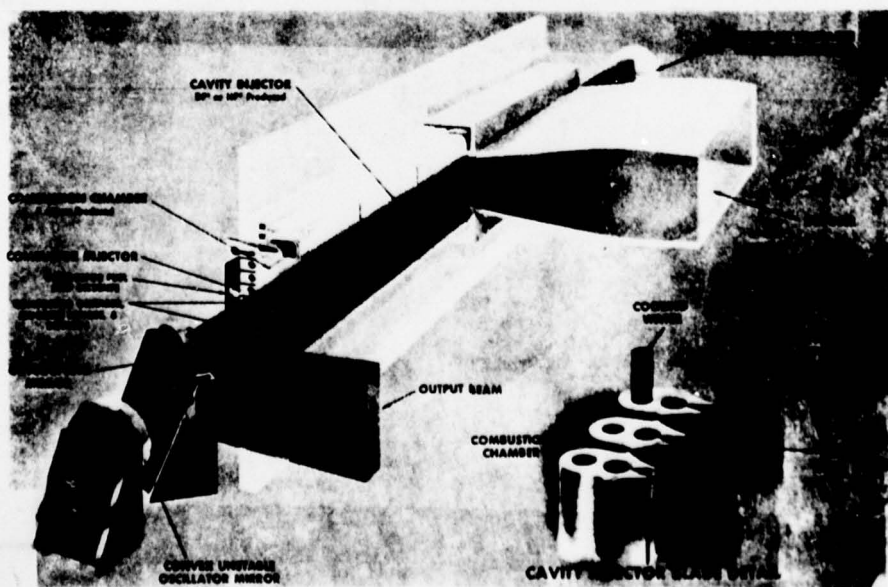


Figure 4. AFWL-BDL Reactant Flow Field

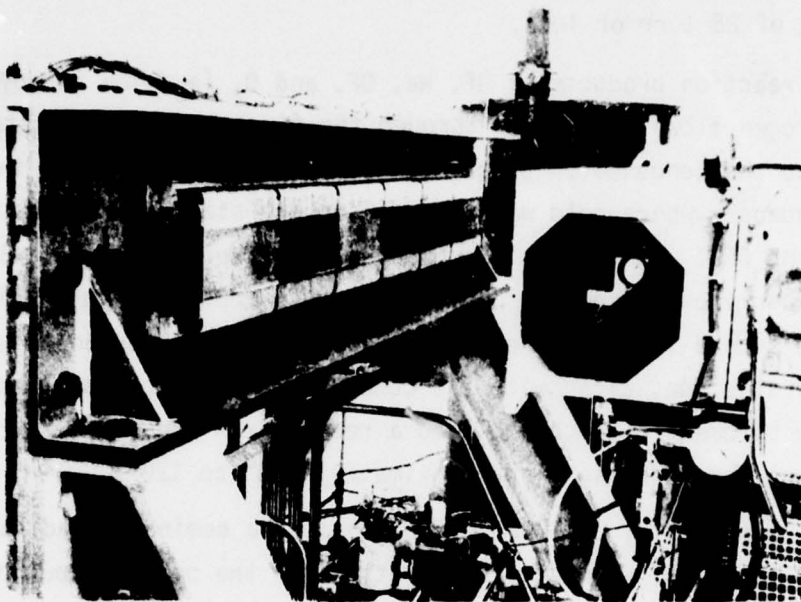


Figure 5. BDL Modules (Six) Installation

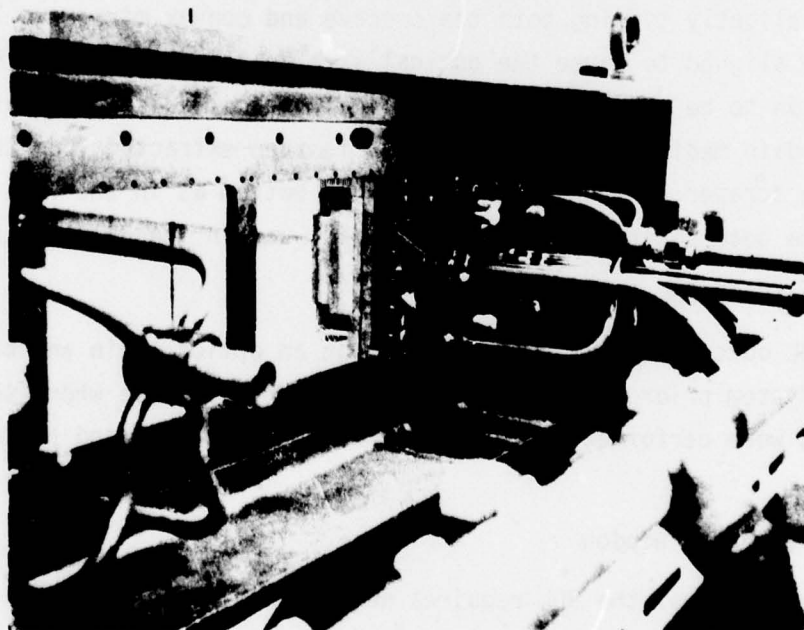


Figure 6. Front View of One BDL Module

system will pump BDL flow rates while maintaining a low pressure in the 6-foot duct of 25 torr or less.

Laser reaction products of HF, He, DF, and D₂ (and the aerodynamic window nitrogen flow) are pumped through the first stage of the steam ejector into the condenser. Discharge of the first stage flows into the ejector condenser where cold water condenses the steam and condensible gases (HF and DF). Noncondensable gases such as He, N₂ and D₂, along with some vapor carry over from the condenser, are pumped to atmospheric pressure by the second stage of the steam ejector system. Condensed steam from the first stage, along with the condensible laser gases, flows through the barometric discharge into a reservoir. The temperature of the fluid leaving the condenser is approximately 100° to 120°F.

In the HF/DF mode, the BDL device provides a nominal broad band power level of 60 to 70 kW. Temporal fluctuations of the power output have been determined to be less than 10%.

The BDL was operated in a half mode configuration to produce an unobscured beam for this program. To achieve the half mode configuration, the optical axis of the resonator cavity is moved upward by raising the convex mirror and slightly tipping both the concave and convex mirrors. These mirrors are aligned to cause the optical axis associated with the half mode configuration to be parallel to the original optical axis and located within the gain medium. The laser energy is then extracted from the bottom part of the scraper, rather than the top and bottom as in the full mode design. The beam power for these test series was in the 38 to 45 kW level.

2. OPTICAL TRAIN AND COMPONENTS

The BDL outcoupled beam was put through an optics train and beam conditioning system prior to entering the BDL lower vestibule where the SABTS experiments were performed. Figure 7 shows the beam path and basic optical components.

a. BDL Aerodynamic Window

The operation of the BDL requires near vacuum (below 10 torr) pressure in the optical cavity. Extraction and propagation of the laser energy involves a transition step from a few torr to atmospheric pressure.

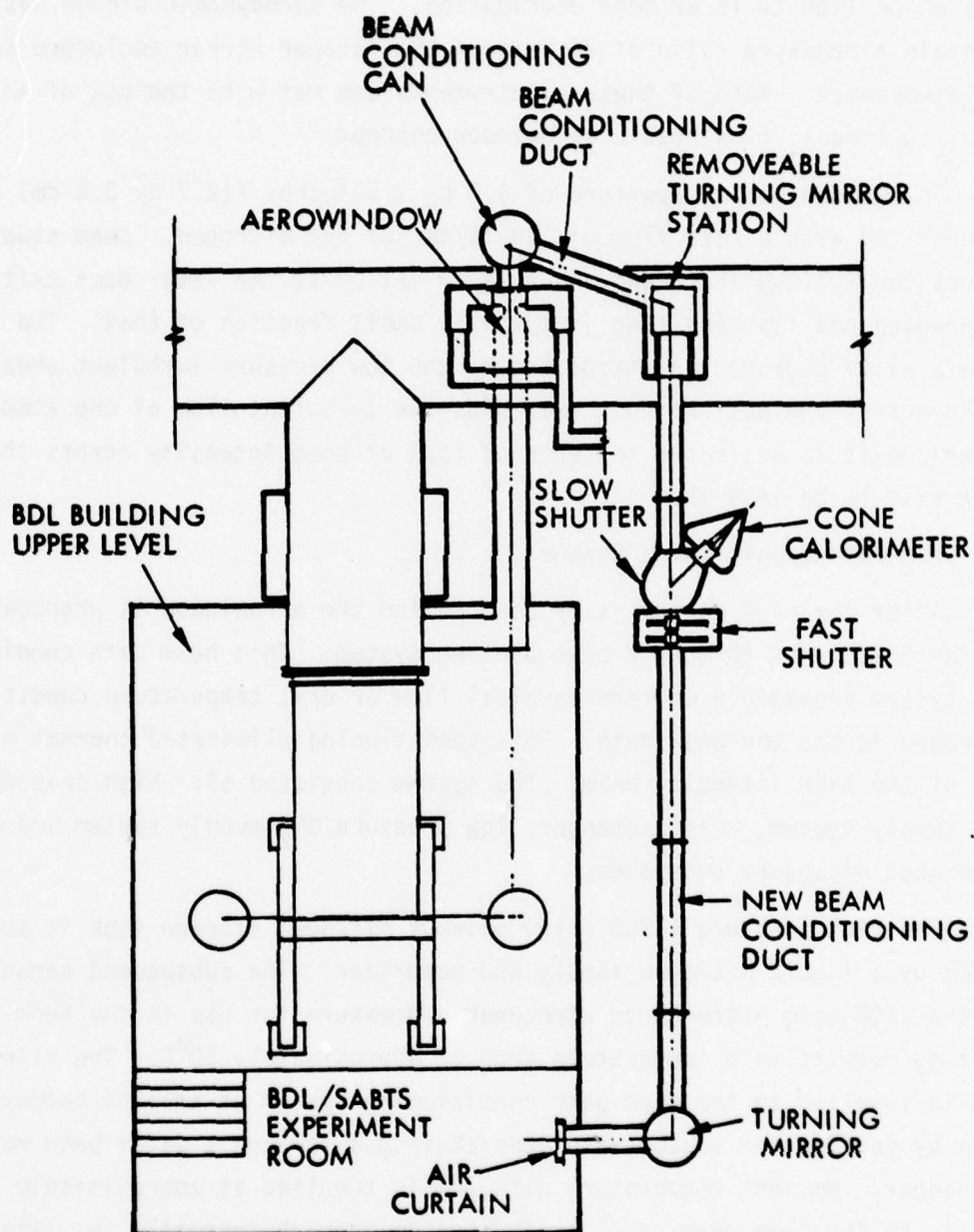


Figure 7. Beam Path and Optics Components Schematic

The principal requirement for the BDL aerodynamic window is to pass the 4.0 by 1.0-inch chemical laser beam from the low pressure laser cavity region into the atmosphere without passing through a solid window. The foremost consideration of such an aerodynamic window is to minimize problems which lead to laser beam degradation. The aerodynamic window has to maintain a pressure ratio of 76 between the scraper mirror enclosure and the atmosphere. Both of these requirements are met with the use of an axial supersonic flow nozzle aerowindow concept.

The window has an aperture of 5.0 by 1.5 inches (12.7 by 3.8 cm) and is operated with a mass flow of 3.0 lb/sec of dry nitrogen. Beam steering across the oblique shock and shear layer set up at the laser duct exit is 12 μ radian and its resulting jitter is a small fraction of that. The beam quality degradation introduced by the low pressure turbulent shear layer across the optical duct exit plus the turbulent flow at the atmospheric exit is estimated in terms of loss of beam intensity across the duct exit to be less than 1%.

b. Beam Path Conditioning System

After the high energy laser beam exited the aerowindow it propagated to the SABTS room through a beam ducting system. This beam path conditioning system provided a uniform vertical flow of dry, temperature conditioned, nitrogen across the beam path. This conditioning eliminated thermal blooming of the high intensity beam. The system consisted of: high pressure GN_2 supply system; heat exchanger; low pressure GN_2 supply system and a beam duct/enclosure subsystem.

The high pressure (2200 psig) gaseous nitrogen storage tank is supplied by a liquid nitrogen supply and vaporizer. The subsequent expansion of the 2200 psig nitrogen to atmospheric pressure for use in the beam ducting results in a temperature drop of approximately 50°F. The nitrogen is supplied to the beam path conditioning system at ambient temperature by passing the subambient temperature gas through a water bath heat exchanger. Ambient temperature nitrogen is supplied at approximately 2 psig to the beam path conditioning system through thermally insulated low heat capacity sheet metal ducting. The flows to each beam duct section and mirror enclosure are adjusted by means of butterfly dampers.

This passive thermal control system has resulted in a nitrogen temperature difference in the mirror enclosures and the adjacent beam ducts of 1°F or less during day or evening operations. Interferometer test results obtained on a test duct section and mirror enclosure indicated that beam quality would be seriously degraded if the temperature between the N_2 in a mirror enclosure and in the adjacent beam duct section exceeded 1.5°F for the turbulence conditions existing at the enclosure/beam duct interface.

A cross section drawing indicating the features of construction of the beam duct is shown in figure 8. The nitrogen flow is down in a vertical direction across the beam. The region through which the beam passes is maintained at approximately 0.5 inch of H_2O gauge pressure by a selected filter material backed up by hardware cloth. The internal surface of the flow distribution plenum is covered with a 0.5-inch thickness of Minicel, closed cell foam insulation. The beam path duct system is shown in figure 9.

A similar N_2 flow distribution system was used for the mirror enclosures. The flow is directed vertically downwards across the mirrors. Internal baffles and filter cloth are used in the enclosures to aid in directing the flow across the beam path.

The beam duct pressure of 0.5-inch H_2O gauge is obtained using an N_2 curtain at the downstream end of the system, just before the SABTS. The centrifugal force generated by injecting a rectangular jet of N_2 along a curved surface at an approximate velocity of 160 fps eliminates the axial flow from the beam duct. The configuration of the N_2 curtain at the beam duct termination is shown in figure 10.

c. Beam Shutter System

The shutter system provides the capability to turn the beam off and on during the experiment to within a few milliseconds of preselected times. The enclosure for the shutter system is shown in figure 11.

The shutter must be fast acting to rapidly cut off the beam in case of sudden onset of damage, to allow minimum dead time between target changes, and further to better define damage onset levels where a rectangular shaped pulse in time is desired. For fast closing shutters, light

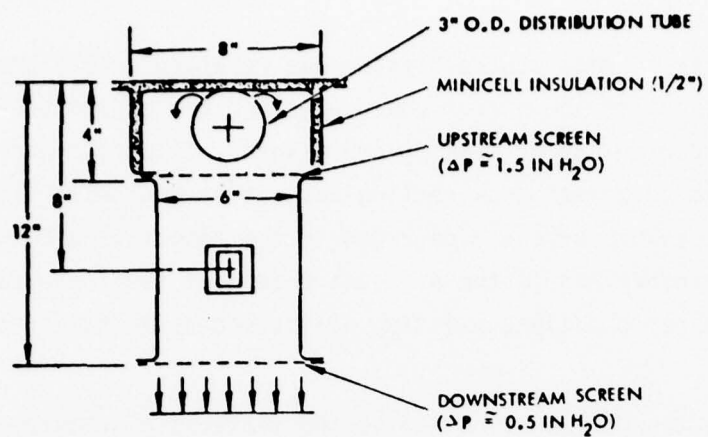


Figure 8. Cross Section of Typical Beam Duct

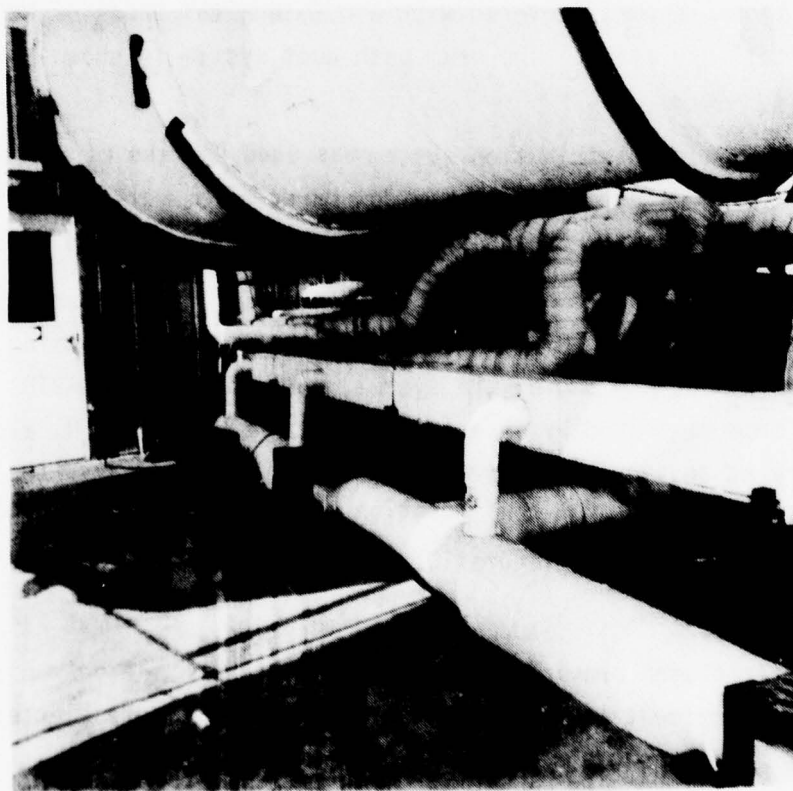


Figure 9. Beam Path Duct System

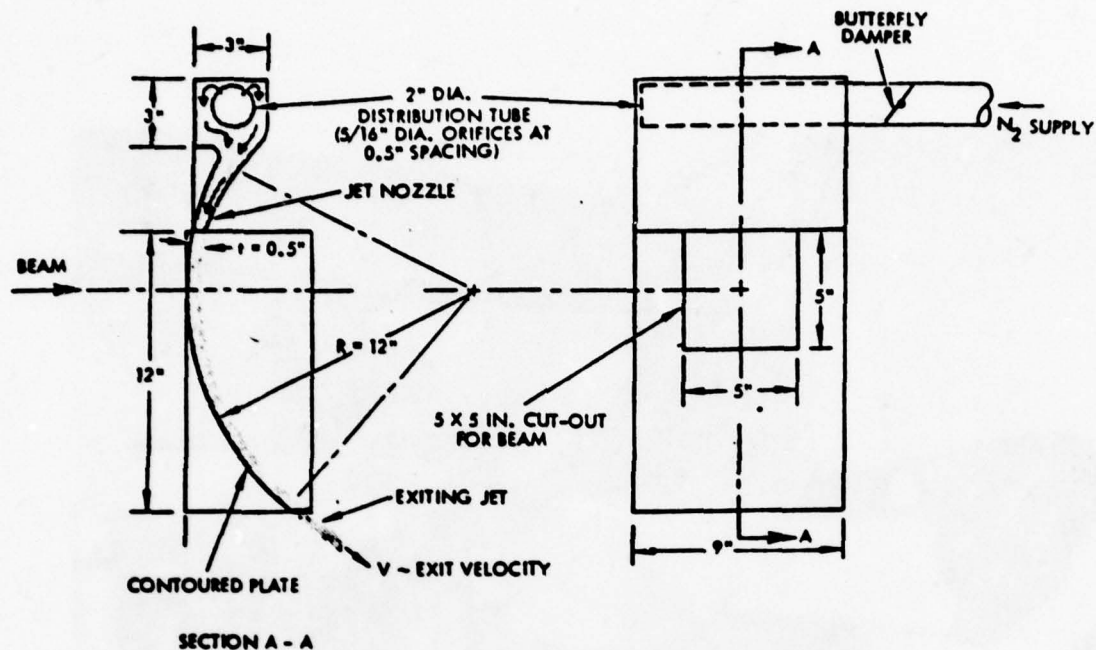


Figure 10. Configuration of N_2 Curtain at Beam Duct Termination

weight is desirable. However, for long periods or continuous duty, a heavier water cooled shutter is required. To satisfy both requirements, beam control is established through the use of two shutter systems designated the slow and fast shutters, operated in conjunction with a sequencer.

The slow shutter shown in figure 12 is a pneumatically actuated, water-cooled metal mirror which can close and obscure the beam in less than 200 milliseconds. In the closed position the BDL beam is reflected into a water-cooled whole beam calorimeter, which is used to determine the primary beam power during the test runs. Since the slow shutter is designed to withstand high flux levels for extended periods of time, it is closed during a test sequence to permit resetting of the fast shutter.

The fast shutter is used to provide beam pulse intervals with fast rise and fall times. This shutter mechanism, shown in figure 13, utilizes uncooled highly reflective metal mirrors which can be rapidly translated along separate but parallel tracks. To set the fast shutter, the mirror blades are pneumatically cocked against a spring load and mechanically

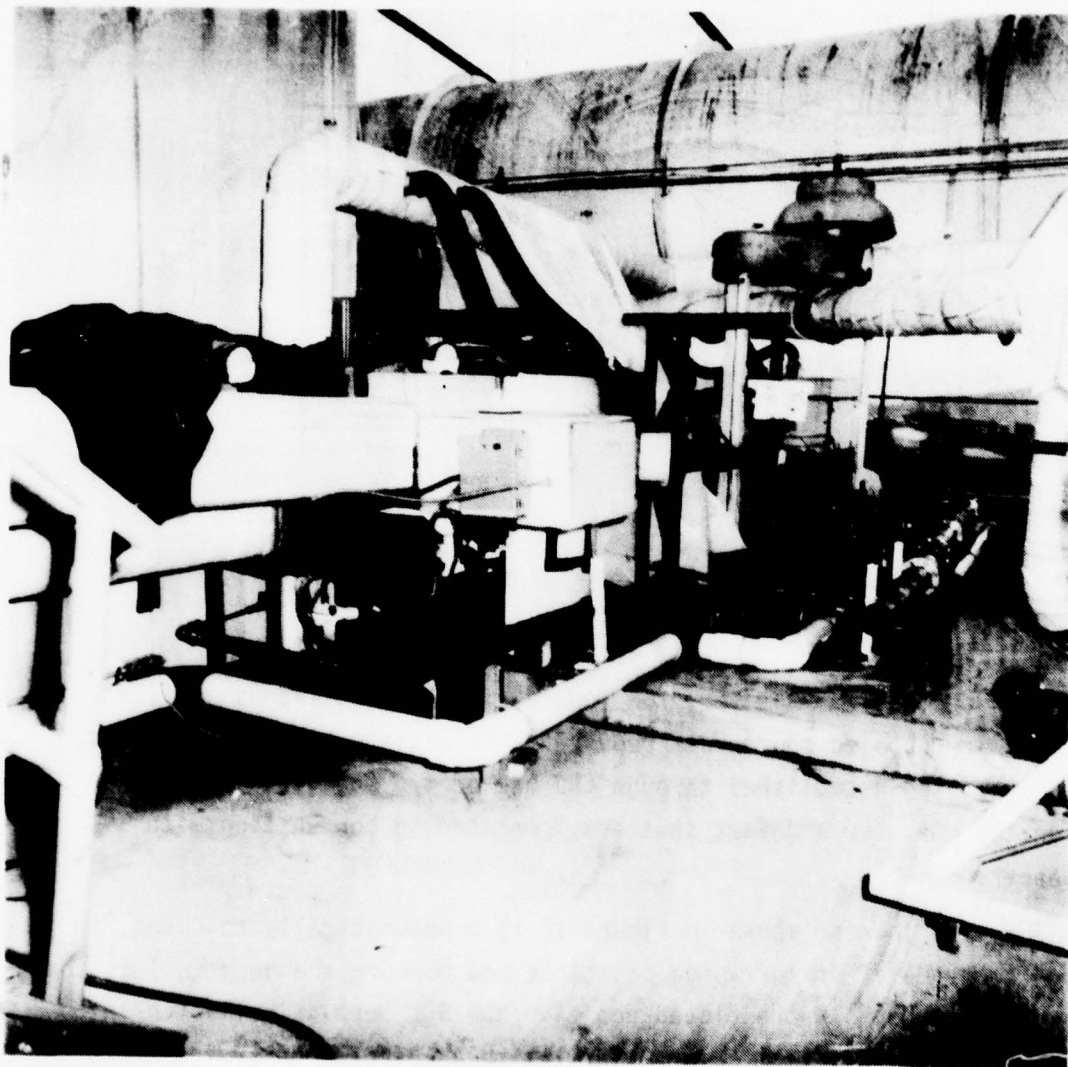


Figure 11. Shutter System Enclosure

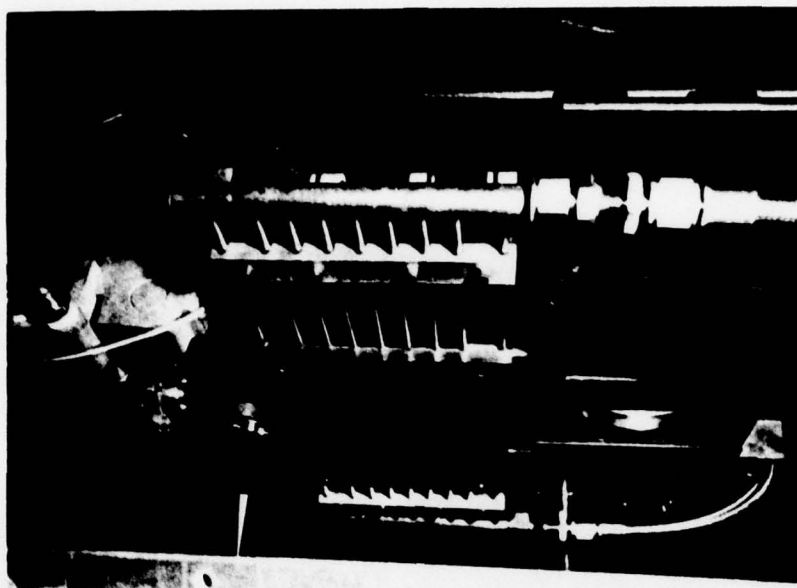


Figure 12. Slow Shutter

latched. In the cocked position, the opening blade obscures the beam. On command it is unlatched and after a 40 to 60 millisecond acceleration period is pushed out of the beam path in 5 to 10 milliseconds. After the required exposure interval, the closing blade is unlatched and the beam is completely obscured in about 70 milliseconds. As soon as the beam is completely obscured, the water-cooled slow shutter is closed to protect the fast shutter mirrors. Once the next target is in position the fast-slow shutter sequence is repeated.

d. Power Measurement

The absolute magnitude of the beam power for a given run is generally measured during the first and last three seconds of the run by the primary calorimeter sampling the reflected radiation from the slow shutter. A cross section of the water-cooled cone calorimeter is shown in figure 14. A photograph of the cone calorimeter as it sets in front of the slow shutter is shown in figure 15. The shallow cone angle was employed to spread the high power fluxes of the outcoupled beam over a large area and reduce the thermal loading per unit area. The power absorbed by the calorimeter is determined from measurements of the coolant water flow-rate and the

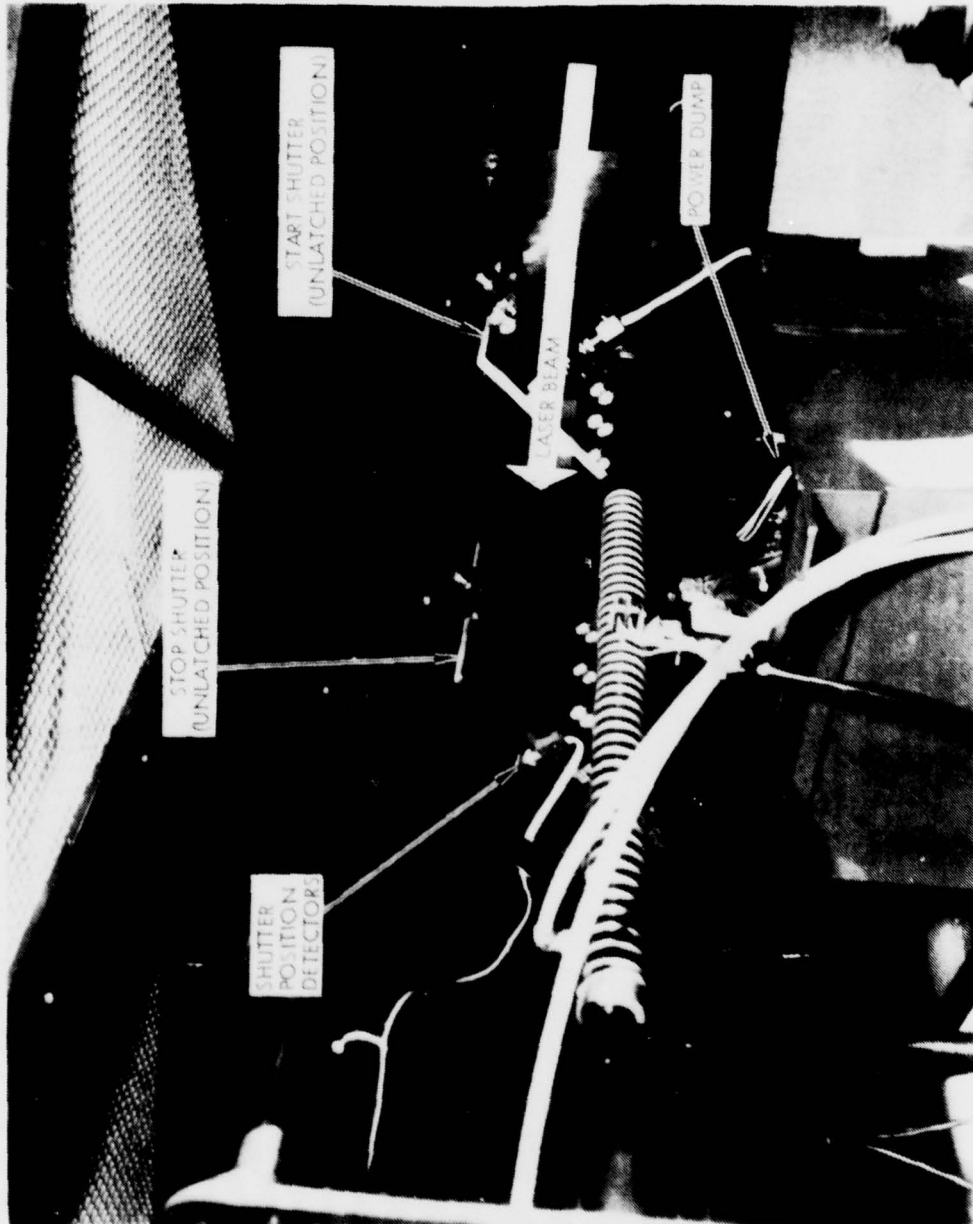


Figure 13. Fast Shutter

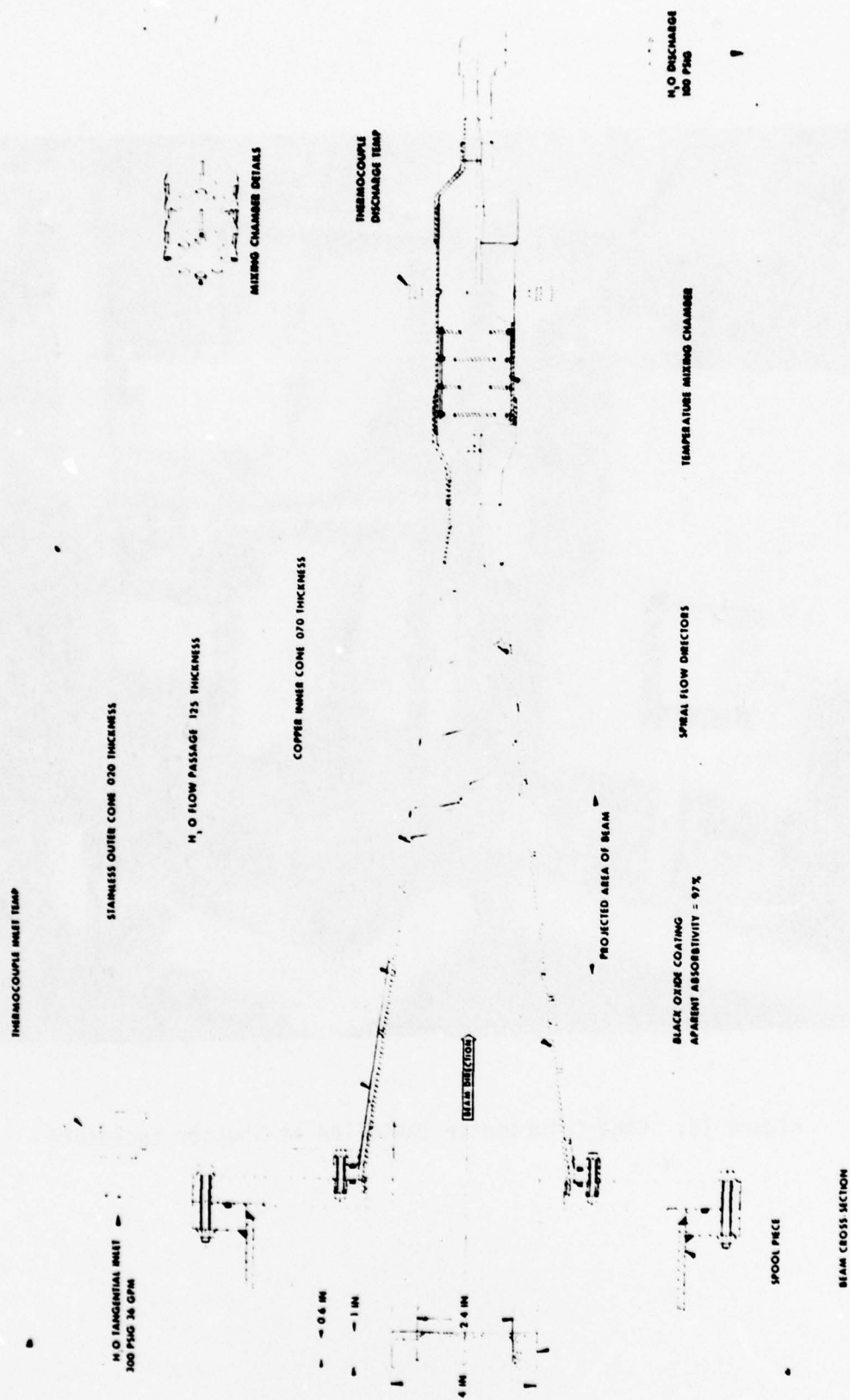


Figure 14. BDL Cone Calorimeter Schematic

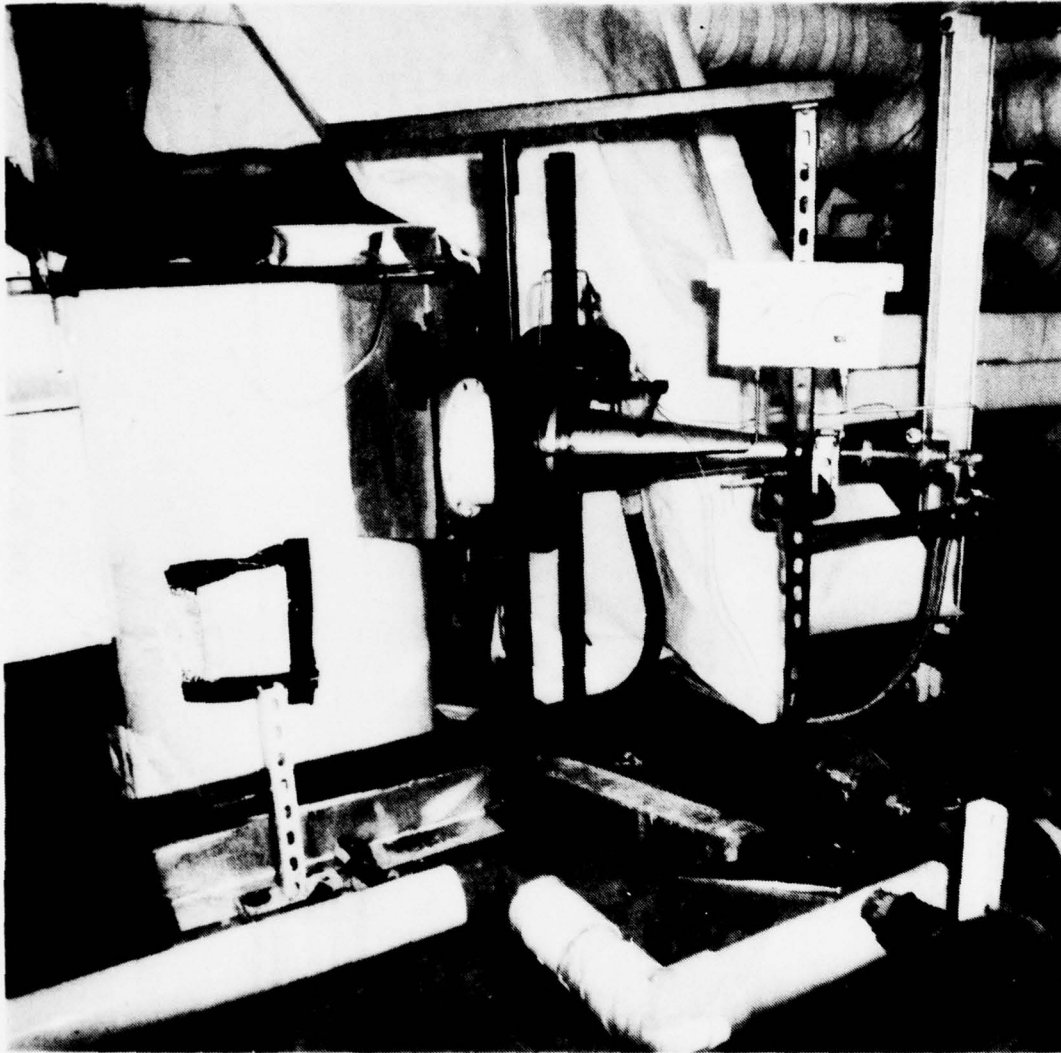


Figure 15. Cone Calorimeter Installed at Shutter Enclosure

temperature difference (ΔT) between the entering and exiting water. The coolant water flow-rate is measured using a calibrated turbine-type flow-meter. Typical ΔT s measured during power tests ranged from 7 to 8°F with a coolant water flow rate of about 36 gpm.

The absolute value of power at the start of the run is used to calibrate the simultaneous signal obtained from an IR $P(t)$ detector, which samples the scattered radiation from an upstream turning mirror. A typical $P(t)$ relative power trace is shown in figure 16. Variations of power output as a function of time during a typical run are less than 5%.

3. CONTROL AND INSTRUMENTATION

Control for SABTS was provided by an interconnection of the FACC programmer-controller in the BDL annex to the remote control panel in the Main Control Center. This connection allowed for operation of required manual functions and the synchronization of the delivery of the BDL beam to SABTS. The PDP-8 was used as a programmer to automatically sequence the operation of the SABTS with the opening and closing of the slow and

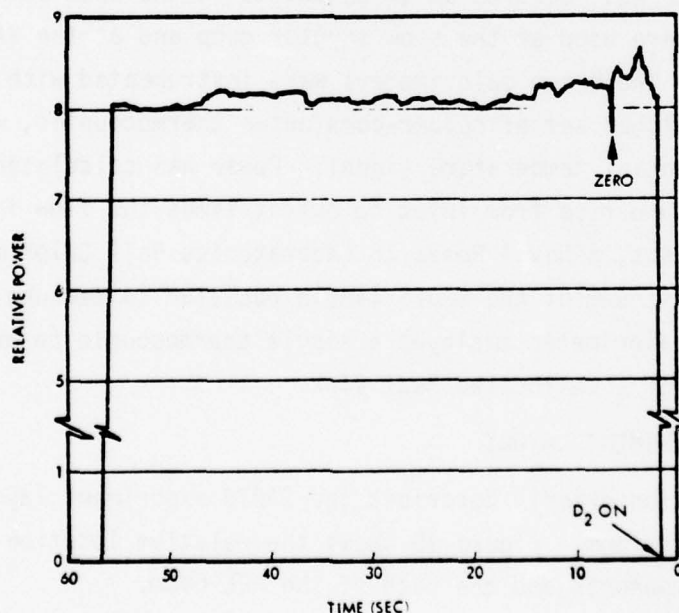


Figure 16. Relative Power vs. Time as Seen by $P(t)$ Instrument

fast shutters. In addition, manual controls were provided adjacent to the remote control panel for override of programmed carousel positions and/or burn times. Visual indicators and/or manual controls were provided in this same area for the status of the beam control shutters, the carousel index status, and the various permit, override, and abort signals.

All signals indicated as instrumentation in figure 17 were recorded on an oscillograph to provide verification of proper function and time correlation.

Instrumentation for parameters concerning the operation of the BDL device such as pressures, temperatures, fluid flows, voltages and reactant valve operations was routed through the BDL Navy ARPA Chemical Laser and effect test shelter patch boards to the Main Control Center instrumentation patch system where it was routed to the various displays and recording systems as required per the Test Plan (figure 18). The AGA IR camera signals were patched to a high speed analog recorder for subsequent data analysis and to an oscilloscope display for real-time monitoring. This system also generated a $P(t)$ signal for beam on correlation to TRW and SABTS instrumentation.

Beam power was measured at three points in the beam path. Cone calorimeters were used at the slow shutter dump and at the SABTS input clipper dump. These two calorimeters were instrumented with a water flowmeter and a matched set of copper-constantan thermocouples, wired to produce a differential temperature signal. Power was calculated from the water temperature rise from inlet to outlet times the flow in gpm. During some of the tests, a Naval Research Laboratories Ball Calorimeter was installed downstream of the SABTS sample position to measure power at that point. This calorimeter employed a single thermocouple to measure the temperature rise of a calibrated heat sink.

4. SABTS EXPERIMENT LAYOUT

This section briefly describes the SABTS experiment layout inside of the BDL effects room. Figure 19 shows the relative location of the primary experiment components and the path of the HEL beam.

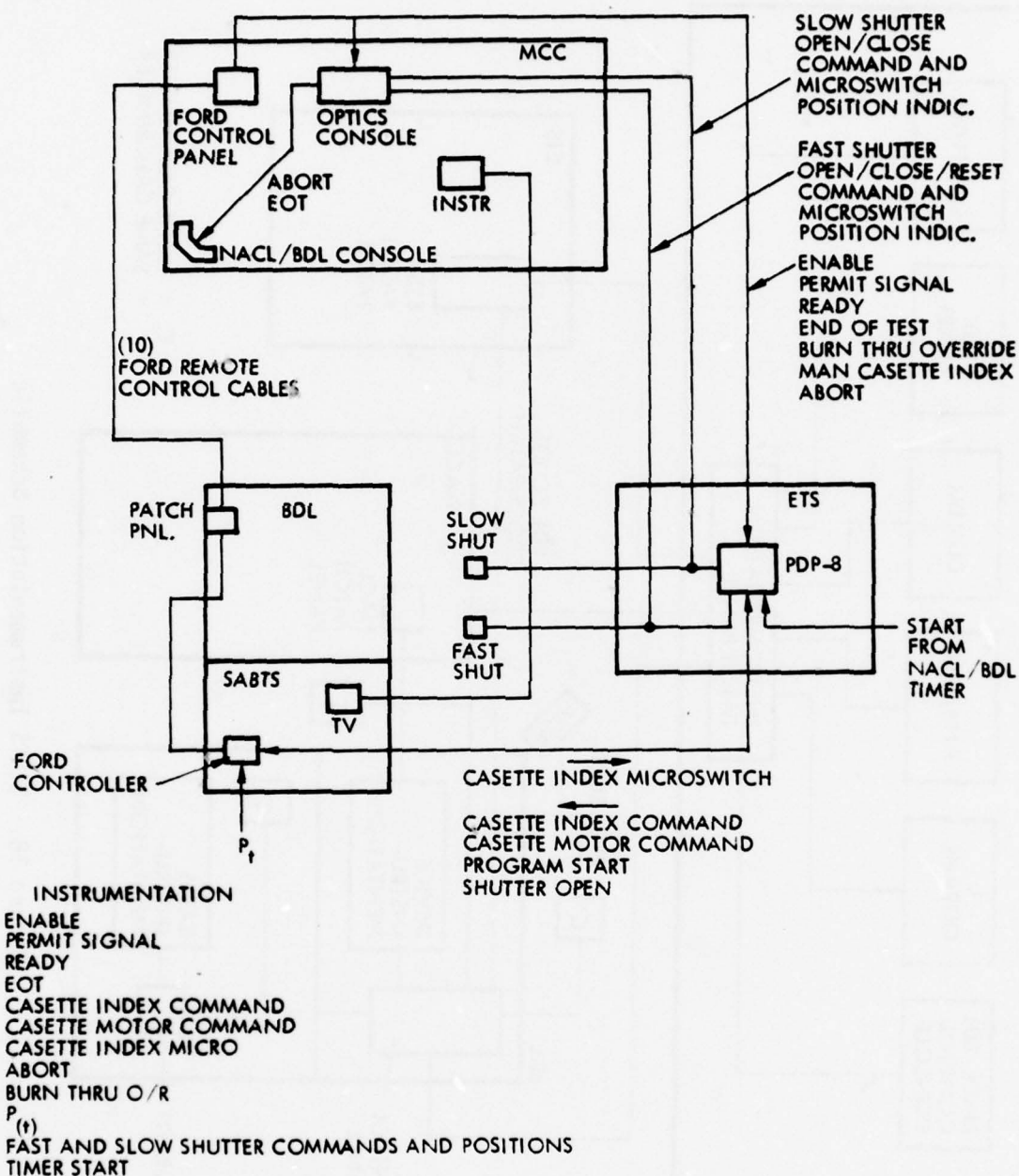


Figure 17. SABTS Control Schematic

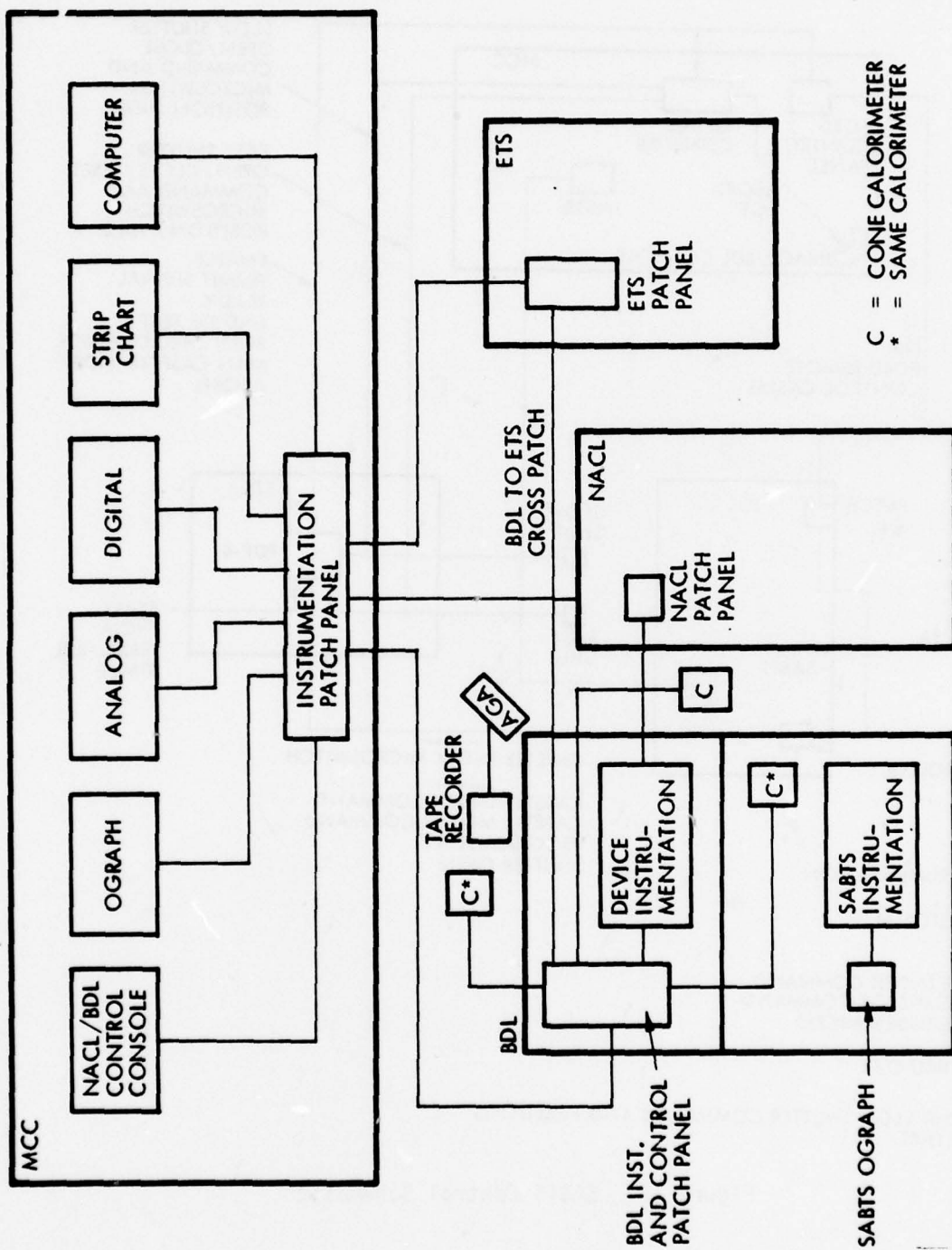


Figure 18. SABTS Instrumentation Schematic

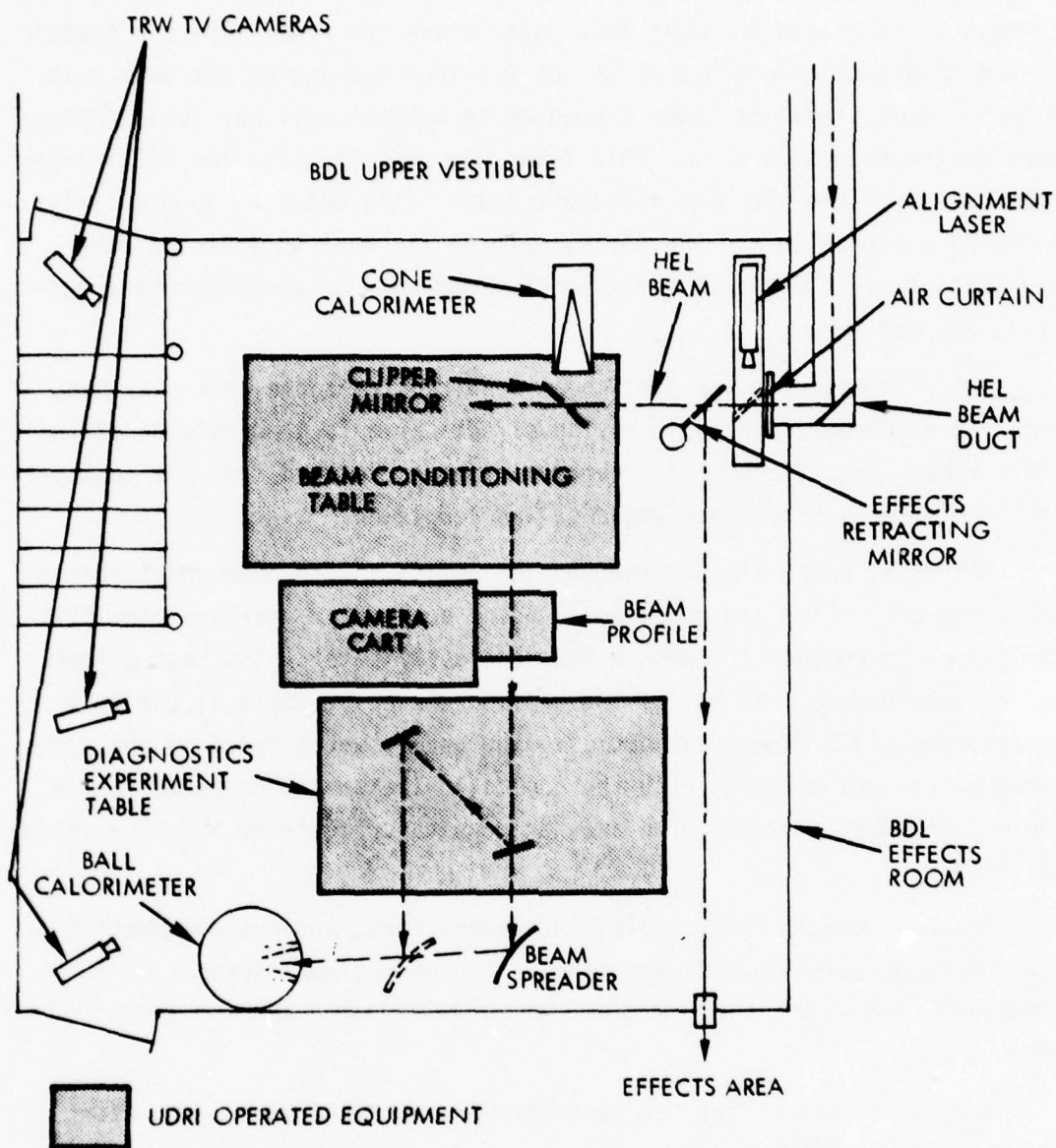


Figure 19. SABTS Experiment Layout

The HEL beam entered the BDL lower vestibule in the northwest corner from the BDL optics train (Sect. III-2). The beam passed through an air curtain as it exited the beam duct just inside the room. The air curtain served to maintain an overpressure of 0.5-inch H_2O inside the beam duct. A helium neon alignment laser placed on an optical rail was located adjacent to the beam duct exit. This laser was used to align the SABTS experiment optics to the HEL HeNe alignment beam. This was done by precisely indexing a mirror in the HEL optics path on the rail so that the HeNe beam was always coincident with the HEL beam path as described by a separate HEL HeNe beam.

Prior to entering the SABTS beam conditioning table, a copper heat sink mirror directed the beam to the effects area located outside of the SABTS room. The effects retractable mirror was removed from the beam path once the effects experiment sequence was completed.

The total power allowed through the optics in the beam conditioning table was controlled and measured by using a circular aperture beam clipper mirror in conjunction with a TRW cone calorimeter. The beam clipper mirror was located just inside the beam conditioning table as the beam entered the SABTS experiment optics. The beam power clipped by the apertured mirror was measured with the cone calorimeter and compared to the whole beam power measured with another cone calorimeter at the slow shutter position.

The beam conditioning table, the camera cart, and the diagnostics table were operated by UDRI personnel. The operational details of these components and details of the SABTS experiment itself are not described here.

The basic path of the HEL beam through the SABTS experiment stations is shown in the SABTS experiment layout figure 19. The HEL beam passed through the optics of the beam conditioning table into the diagnostics table where the primary experiment was performed. The beam profile was measured between the tables. The remaining HEL beam after it left the diagnostics table was dumped into an NRL ball calorimeter.

There were two alternate paths through the diagnostic table optics depending on whether a transmission or a reflection sample was being

irradiated. This determined the location of the beam spreader mirror positioned outside the diagnostics table. This mirror also served to spread the concentrated HEL beam to prevent damage to the ball calorimeter which might have resulted from the high beam intensities.

Also shown in the SABTS experiment layout are three television cameras. These cameras were used to visually monitor the experiment components during a test to determine the necessity of an emergency shutdown.

5. EFFECTS STATION (ADD-ON EXPERIMENT)

The beam for the effects experiment was obtained as it left the beam duct in the SABTS test room and was directed outside the building through a 6- by 6-inch hole in the wall, shown schematically in figure 19. A retractable mirror mount was fabricated for the purpose of pulling the mirror (8- by 9-inch copper furnished by the Navy) from the beam path at the conclusion of the effects experiment. The mirror actuator enabled the experimenter to pull the mirror up from the beam or down from the beam. Proximity switches at either end of the stroke indicated the position of the mirror at the test console.

The basic effects area hardware included a 3- by 1-inch wind tunnel supplied by an 18 bottle farm. The wind tunnel was supplied by the Air Force Weapons Laboratory. The pressure to the dome of the regulator and air supply for the wind tunnel solenoid valve were supplied from the upstream air line to the wind tunnel.

A 24- by 24-foot canvas canopy was provided for the test area to protect equipment and instrumentation from weather. Transite sheets were situated behind turning mirrors and the target position as a safety measure. In addition, two video cameras were provided to monitor the effects experiment from the control center; one for an overall view and one to determine recording equipment readiness.

a. Instrumentation and Controls

The experiment instrumentation and recording equipment were supplied by the AFWL. The local experiment oscillograph, cameras, and the missile controller were turned on remotely from the control center during the count-down sequence.

Video coverage included an overall view of the experiment and a closeup of the missile controller status gauges.

The complete list of Control and Instrumentation signals is given in table 3. The PDP8 controller provided two commands: one to retract the effects director mirror in the SABTS building and the other to turn on the wind tunnel at 3 seconds prior to acquiring the beam. An interlock switch on the retractable mirror confirms mirror retraction to the computer. The experiment/test site electrical interface schematic is shown in figure 20.

Table 3. LIST OF EFFECTS EXPERIMENT TEST COMMAND
AND INSTRUMENTATION SIGNALS

<u>Controls Signals</u>	
Manual:	<ol style="list-style-type: none">1. Instrumentation ON2. Instrumentation OFF3. Effects Timer Package START4. Effects Timer Package OFF5. Effects Director Mirror Retract Signal (PDP8 Override)6. Effects Director Mirror Manual Retract
PDP8:	<ol style="list-style-type: none">1. Mirror Retract Signal2. Wind Tunnel Turn on (110 VAC)3. Mirror Interlock Feedback (in/out)
<u>Instrumentation</u>	
Video coverage:	<ol style="list-style-type: none">1. 1 overall with monitor for test conductor2. 1 for recording equipment observation (optics console)
Monitor signals:	<ol style="list-style-type: none">1. Effects Director Mirror position (optics console)2. Fast Shutter/slow shutter, open/close (already on optics console)
Record:	P(t) (same as SABTS)

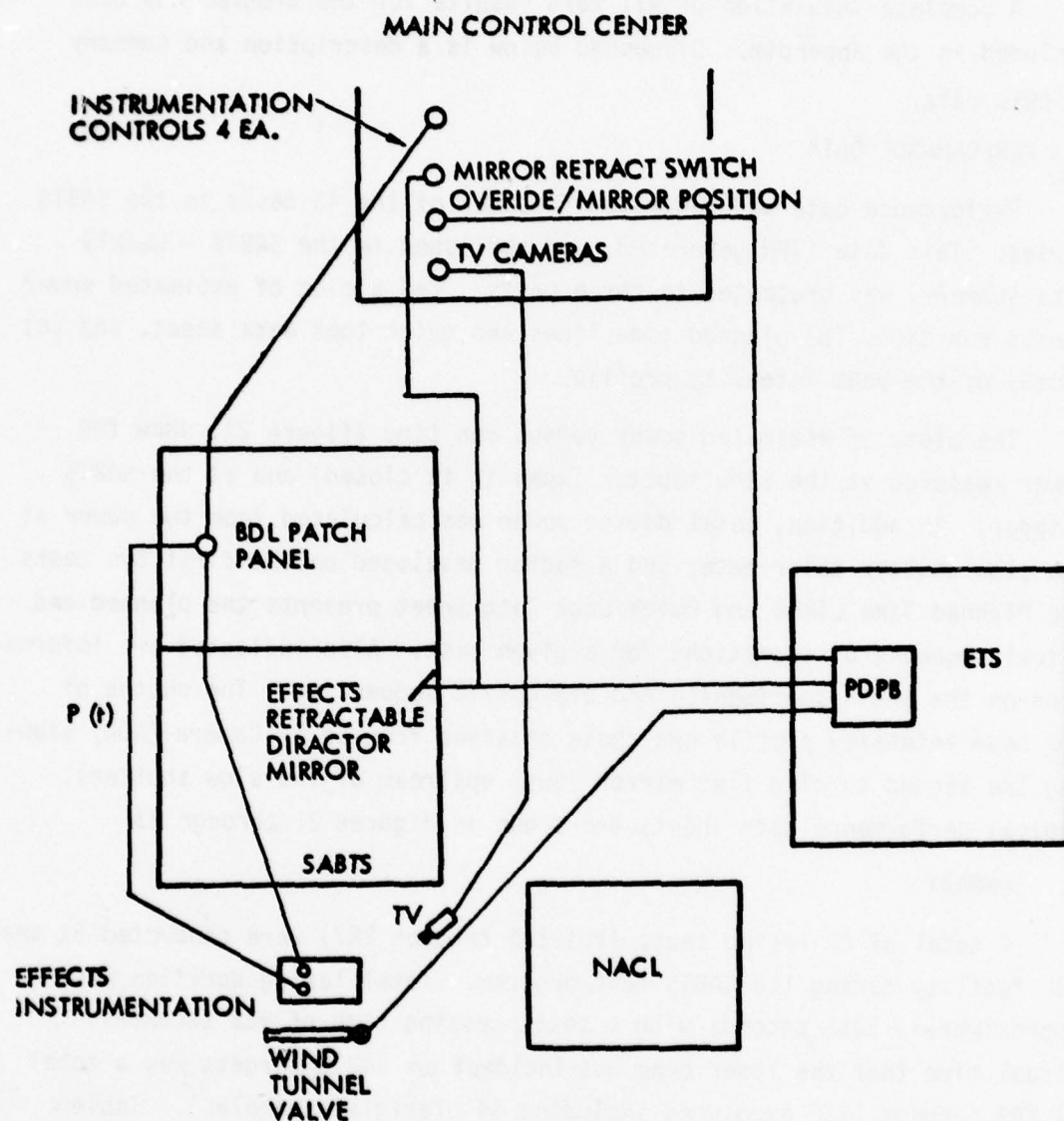


Figure 20. Effects Instrumentation/Controls Layout

Section IV

TEST RESULTS

A complete tabulation of all test results for the program has been included in the appendix. Discussed below is a description and summary of this data.

1. PERFORMANCE DATA

Performance data was generated for each of the 43 tests in the SABTS series. This data (TRW generated, and published in the SABTS - Weekly Data Summary) was presented in three parts: (a) a plot of estimated power versus run time, (b) planned time lines and quick look data sheet, and (c) photos of the beam intensity profile.

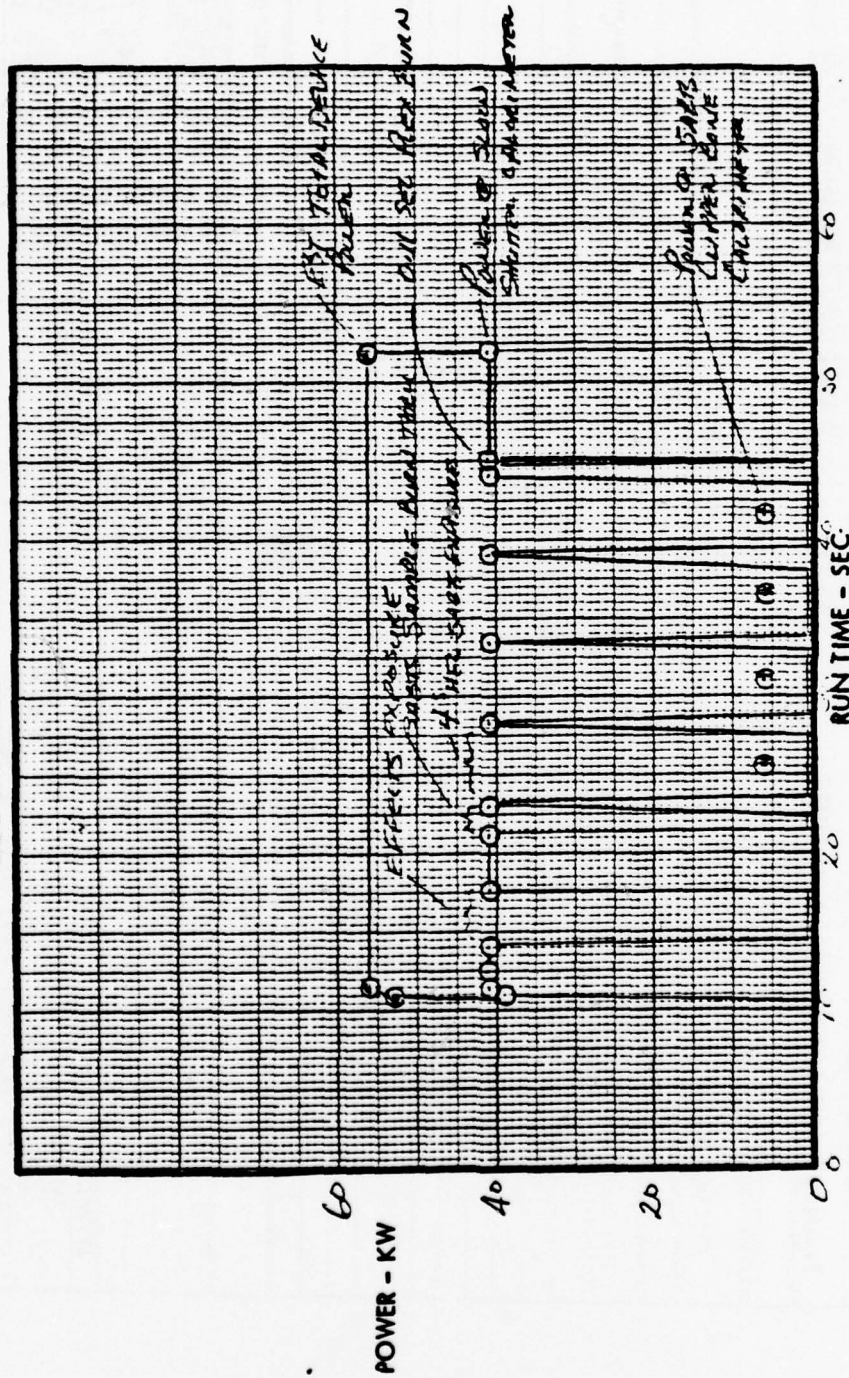
The plots of estimated power versus run time (figure 21) show the power measured at the slow shutter (when it is closed) and at the SABTS clipper. In addition, total device power was calculated from the power at the slow shutter calorimeter and a factor developed on the first two tests. The Planned Time Lines and Quick Look Data Sheet presents the planned and actual sequence of operations for a given test. Also indicated are information on the SABTS specimen(s) and diagnostic sequencing. The photos of the beam intensity profile are those obtained from an IR Camera (AGA) viewing the second turning flat mirror (just upstream of the slow shutter). Typical performance data sheets are shown in figures 21 through 23.

2. SUMMARY

A total of 43 lasing tests (VL1-245 through 287) were conducted at the BDL facility during the SABTS test program. Total lasing duration was approximately 1058 seconds with a total testing time of 922 seconds. Actual time that the laser beam was incident on SABTS targets was a total of 286 seconds (135 exposures including 14 plexiglass samples). Table 4 lists all the tests in the SABTS series and provides pertinent information as to duration, number of samples, purpose and comments. The test duration is defined as the time from combustor oxidizer (F_2) on to cavity fuel D_2 off, whereas lasing duration is from D_2 on to D_2 off. In most cases, the purpose of the test is indicated by the number and the exposure duration

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1 - 2 70

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

L. Sines
2-11-77

Figure 21. Estimated Power vs. Run Time

PLANNED TIME LINES AND QUICK LOOK DATA SHEET										
QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME							
VII-270	SABTS	2-10-77	1935							
D2 FIRE VALVE OPEN (SEC)	10.4	D2 FIRE VALVE CLOSED (SEC)	51.9	LASING DURATION (SEC)	41.5	TOTAL COMPLETED TEST POSITIONS	7	PLANNED TOTAL PWR.	59	
PLANNED TEST NO. 0617/013 TIME LINES AS OF DATE 2-10-77 REVISION 0R1G										
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		1.7		CONFIGURATION				
D. MULLEN		PLANNED PEAK PWR DENSITY		10KW/CM ²		REFLECTIVE TRANSMISSIVE				
PLANNED				ACTUAL						
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	PLEXI		3.0	4.5	14.00	13.0		57.2		
2										
3	PE		4.0	1.10	21.50	20.7		56.8		
4	DOF		4.0	1.10	26.60					
5	DOF		4.0	1.10	31.70					
6	HOUSE		4.0	1.10	36.80					
	HOUSE		4.0	1.10	41.90					
	PLEXI		0.11		47.00					
					47.11	50.9		56.9		
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		ON		O-GRAH		MON.	MAN			
No. 2		"		SANGAMO No. 1		6.0	54.0			
No. 3		"		SANGAMO No. 2		N/A				
No. 4		"		SABTS SEQ.		21.5	47.1			
WIND TUNNEL		11.0	18.00	CALORIMETER (SABTS)		21.5	47.1			
SABTS INST.				CALORIMETER (SLOW SHUTTER)		10.0	14.0			
HI FLOW SOLENOID		10.0	52.6	"		15.0	21.9			
EFFECTS MIRROR		END OF I		"		47.1	52.6			
* PROFILER										

Figure 22. Planned Time Lines and Quick Look Data Sheet

LASER PERFORMANCE ANALYSIS, RUN VL1-270

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY
APPROX. TIME (SEC) 20

LINEAR PROFILE*
APPROX. TIME (SEC) 20



LEE BERGERSON
BEAM DIAGNOSTICS ENGINEER

Figure 23. Beam Intensity Profile

Table 4. RUN LISTING

Test Number VLI-	Date	Test Duration (sec)	Lasing Duration Planned (sec)	Lasing Duration Actual (sec)	Samples Planned	Samples Actual	Purpose	Comments
245	1-7-77	22.7	8.7	8.7	0	0	Checkout	F ₂ scan samples were plexiglass and Transite Slow shutter did not open. Samples were plexiglass Burn wire termination. SABTS test at 1st position Alignment prism exposed to beam. Manual S/D, low power
246	1-11-77	45.8	35.8	35.8	2	2	Checkout/Alignment	
247	1-13-77	27.3	16.9	16.9	6	0	Checkout/Alignment	
248	1-14-77	27.3	16.9	16.9	6	0	Checkout/Alignment	
249	1-18-77	14.5	25.0	4.1	1	0	Checkout/Alignment	F ₂ scan power remains low on plexiglass sample Mirrors realigned. Pretest power backup F ₂ scan completed. SABTS spider burn through plex samples Plex sample
250	1-18-77	37.6	27.2	27.2	1	1	Checkout/Alignment	
251	1-19-77	37.8	27.4	27.4	1	1	Checkout/Alignment	
252	1-21-77	24.8	18.0	14.4	6	1	1st SABTS Checkout	
253	1-21-77	17.6	7.2	7.2	1	1	SABTS Checkout	Last sample burned through < 1 sec Slow shutter did not open End of Phase II
254	1-22-77	24.3	13.9	13.9	6	6	1st SABTS Specimen	
255	1-24-77	24.1	13.7	13.7	6	6	6/.25 ^s exposures	
256	1-24-77	46.8	36.9	36.9	6	6	6/4 ^s exposures	
257	1-26-77	24.2	13.8	13.8	6	6	6/.25 ^s exposures	
258	1-26-77	46.8	36.4	36.4	6	6	6/4 ^s exposures	
259	1-26-77	24.2	13.8	13.8	6	6	6/.25 ^s exposures	
260	1-27-77	24.2	13.8	13.8	6	6	5/.25 ^s + 1/.05 ^s Plex	
261	1-27-77	46.7	36.3	36.3	6	6	6/4 ^s exposures	
262	1-28-77	24.3	13.9	13.9	6	0	6/.25 ^s + 1/.11 ^s Plex	
263	1-28-77	24.2	13.8	13.8	6	6	5/.25 ^s + 1/.11 ^s Plex	
264	1-28-77	42.7	32.3	32.3	6	6	5/4 ^s + 1/.11 ^s Plex	
265	1-28-77	42.5	32.1	32.1	6	6	5/4 ^s + 1/.11 ^s Plex	

Table 4. RUN LISTING (Continued)

Test Number VLL-	Date	Test Duration (sec)	Lasng Duration Planned (sec)	Lasng Duration Actual (sec)	Samples Planned	Samples Actual	Purpose	Comments
266	2-8-77	23.2	12.8	12.8	2	2	Checkout and Alignment	3.5 ^s exposure to thermal trap (SABTS) 2 exposure to Plex
267	2-8-77	23.2	12.8	12.8	2	2	Checkout and Alignment	3.5 ^s exposure to thermal trap (SABTS) 2 exposure to Plex
268	2-9-77	52.4	42.0	42.0	6	6	5/4 ^s + 1/.11 ^s Plex	~1 ^s Plex exposure at effects station
269	2-9-77	39.6	43	29.2	6	3	5/4 ^s + 1/.11 ^s Plex	3.0 exposure to effects Test aborted - UDRI calorimeter fire
270	2-10-77	51.9	41.5	41.5	6	6	5/4 ^s + 1/.11 ^s Plex	2nd sample burn through 3 sec effects (Plex)
271	2-10-77	52.4	42.0	42.0	6	6	5/4 ^s + 1/.11 ^s Plex	1st sample burn through
272	2-11-77	52.4	42.0	42.0	6	6	5/4 ^s + 1/.11 ^s Plex	3 sec effects exposure
273	2-15-77	40.7	42.0	30.3	6	5	5/4 ^s + 1/.11 ^s Plex	3 sec effects exposure 4 samples burn through - Test term after 5th sample
274	2-16-77	40.7	36.0	30.3	5	1	4/4 ^s + 1/.10 ^s Plex	Reflective samples 3 sec effects exposure Carousel failed to index
275	2-17-77	26.8	38.0	16.9	5	0	4/4 ^s + 1/.10 ^s Plex	3 sec effects exposure Effects miro dropout - no SABTS exposures
276	2-17-77	49.3	38.0	24.6	5	3	4/4 ^s + 1/.10 ^s Plex	1 sec effects exposure (Plex) Lost power during 3rd SABTS sample - F ₂ depletion
277	2-22-77	33.0	22.6	22.6	1	0	1/4 ^s	2/3 sec effects exposure No SABTS exposure - fast shutter not reset
278	2-23-77	30.9	23.0	20.5	1	1	1/4 ^s	No effects attempted. 2.2 ^s exposure to SABTS
279	2-24-77	33.0	23.1	23.1	1	1	1/4 ^s	2/3 ^s effects exposure
280	2-24-77	33.0	22.6	22.6	1	1	1/4 ^s	2/3 ^s effects exposure
281	2-25-77	32.5	22.6	22.6	1	1	1/4 ^s	2/3 ^s effects exposure
282	2-26-77	32.5	22.6	22.6	2	2	1/4 ^s + 1/.1 ^s Plex	1/3 ^s 1/2 ^s effects exposure
283	2-26-77	36.6	26.7	26.7	2	2	1/4 ^s + 1/.1 ^s Plex	1/4 ^s 1/5 ^s effects exposure
284	2-27-77	49	42	40.9	5	5	4/4 ^s + 1/.1 ^s Plex	1/6 ^s 1/3 ^s effects exposure F ₂ premature shutdown
285	2-28-77	54.5	45	44.1	6	6	5/4 ^s + 1/.1 ^s Plex	2/3 ^s effects exposure
286	2-28-77	34.5	24.6	24.6	2	2	1/4 ^s + 1/.1 ^s Plex	2/3 ^s effects exposure
287	3-1-77	44.7	45	34.8	6	6	5/4 ^s + 1/.1 ^s Plex	3 SABTS samples override after ~1 ^s samples

of the sample; i.e., $6/.25^s + 1/.11^s$ plex means six SABTS samples each exposed to the HEL beam for 0.25 seconds plus a plexiglass sample exposure for 0.11 seconds. During the later portion of testing (VL1-266 and subsequent - Phase III) the HEL beam was also directed at various effects specimens (add-on experiment) in addition to the SABTS exposures. Some device/optics related problems were experienced during the initial phase of testing (VL1-245 through 250); i.e., cavity misalignment, failure to retract alignment periscope, and the slow shutter not opening. Test VL1-251, which featured an F_2 scan to characterize the device, was the last test after which no major adjustments were made to the device or the optical train. Following test 251 only minor adjustments were made in reactant flow rates and optical alignment to maintain device power (as measured at the slow shutter calorimeter) above the 36 kW allowed minimum.

Section V

DISCUSSION OF RESULTS

1. TECHNICAL PERFORMANCE SUMMARY

a. Power Performance

The off-axis mode of cavity alignment (Section III) produces an exiting beam with protruding edges ("fangs"). These edges are removed at the fang clipper producing a square shaped beam. For the first two tests (VLI-245, 246) a cone calorimeter was located at the fang clipper as well as at the slow shutter. Thus, power was measured at the slow shutter and at the fang clipper and total power was calculated from the sum of the two. On subsequent tests the cone calorimeter at the fang clipper was moved to the clipper in the SABTS test area (the fangs were still being clipped but this power was now being dumped into a noninstrumented graphite block).

Figure 24 is a plot of power versus test number showing both the total device power (estimated from the third test to the end of the series) and the SABTS "delivered" power (at the slow shutter calorimeter). Power at the fang clipper calorimeter is also shown for the first two tests. The first seven tests in the program were essentially checkout and reactant (F_2) scans to determine device characteristics. Some difficulties were experienced during these tests related to cavity misalignment and human error. However, once exposures to SABTS sample began (with test VLI-252), delivered power did not drop below the minimum program requirement of 36 kW. One power drop caused by premature depletion of F_2 did occur during run VLI-276.

Delivered power (as measured at the slow shutter when the slow shutter is closed) was determined just before and just following SABTS exposure(s) and the values plotted in figure 24 are those averaged for a particular test. Average delivered power was 42.1 kW ($\sigma = 1.36$ kW) for tests VLI-252 through -287 with a maximum of 44.1 and a minimum of 37.6 kW. It should be noted that this minimum value of 37.6 kW is $> 3\sigma$ below the average value. In fact, on the test (-273) where the lowest value occurred, flow rates were inadvertently set such that a low available F rate (\dot{N}_F) and a low F_2

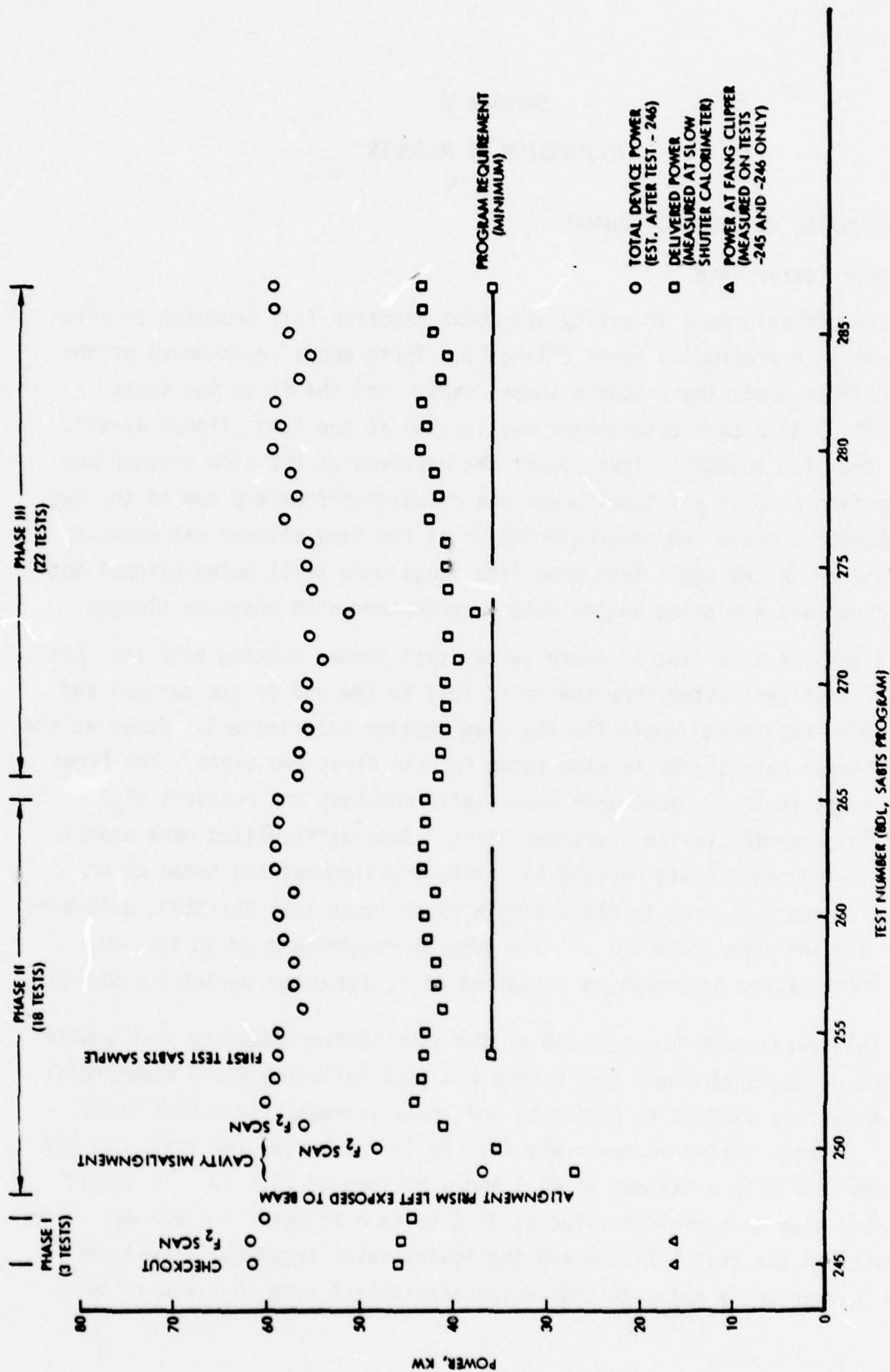


Figure 24. Power vs. Test Number

mass rate coincided to cause the low power. If the value of 37.6 kW is statistically eliminated, average power would be 42.2 with a standard deviation (σ) of 1.14, indicating fairly consistent device power delivery.

b. Optical Performance

The beam size was determined several ways. First, a TRW EMBLAZONU code computer calculation was used to predict the beam profile during the designing stages. A SABTS clipper having a 3.5 cm diameter hole normal to the beam was considered in these calculations. The prediction of beam power and irradiance passing through the hole, and that being reflected by the clipper are shown in table 5. The calculations predicted 24% of the beam would be clipped and 76% would pass through the SABTS clipper.

Table 5. DATA FROM CALCULATIONS BASED ON EMBLAZONU COMPUTER PLOTS

	<u>SABTS Clipper</u>
Total Power to Clipper (kW) (assumed)	50.0
Power through Clipper Hole (kW)	38.0
Power Dumped by Clipper (kW)	12.0
Maximum Irradiance at Clipper (kW/cm ²)	12.5
Average Irradiance through Clipper Hole (kW/cm ²)	3.9

The major method of determining beam size measured through many continued runs was obtained by snapshot imaging of the scattered HEL radiation from the second turning flat mirror at different times into the run using an AGR IR camera. Representative contour and three-dimensional plots are shown in figures 25 and 26. In particular figure 25 shows intensity contours of the beam. Numbers seen in the figure on each countour line indicate percentages of the maximum intensity. Using a 20% cutoff of the contours, beam heights for various runs are presented in figure 27. Allowing for mirror tilt, all widths were equal to or less than the heights, permitting more than the calculated fraction of the beam to pass through the 3.5 cm diameter SABTS clipper.

BDL/SABTS TESTING - AGA

VL1-249 18 JAN 1977

TIME = 13.0 SEC

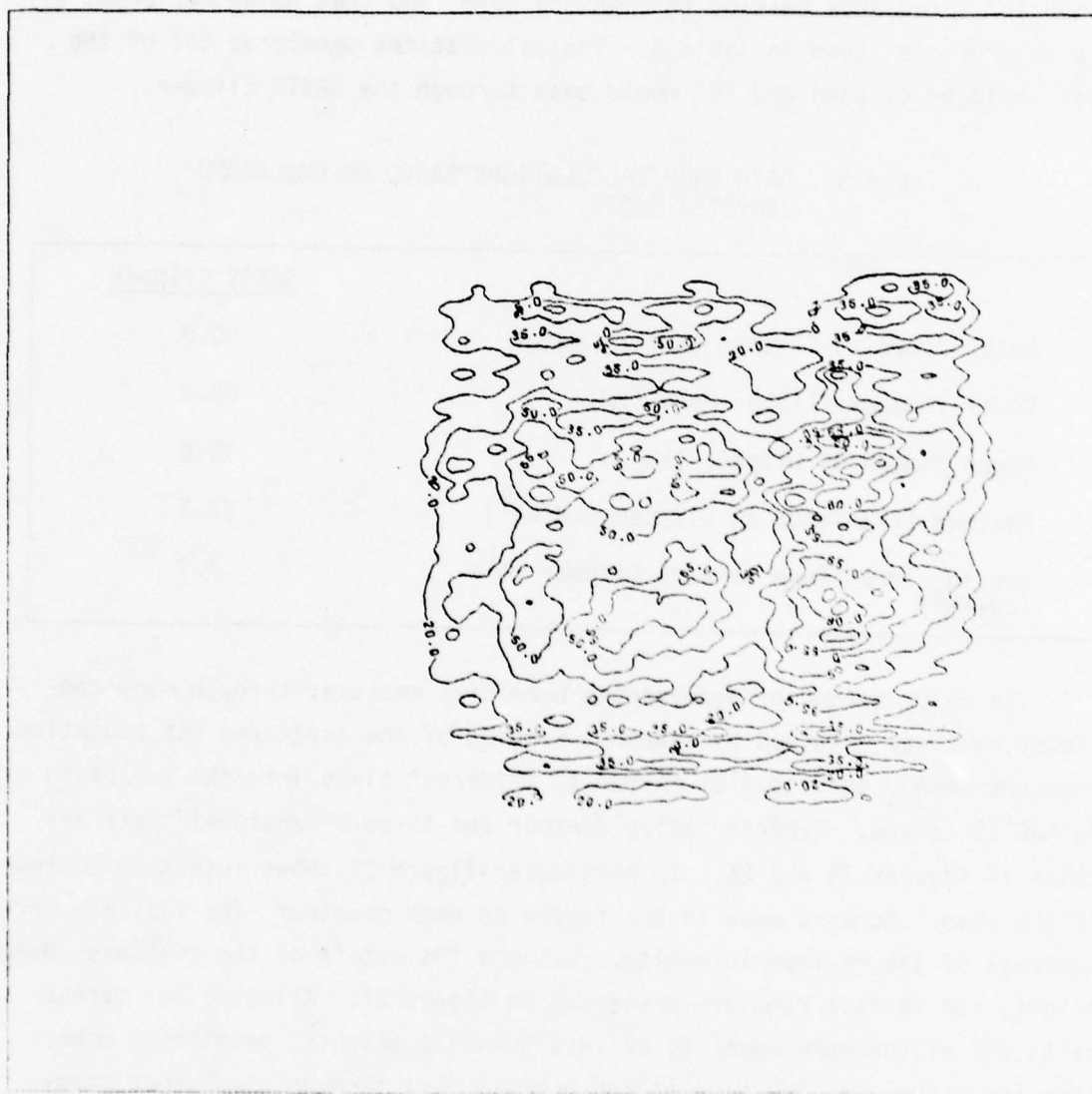


Figure 25. AGA Contour Plot of HEL Beam on Second Turning Mirror

BDL/SABTS TESTING - AGA

VL1-249 18 JAN 1977

TIME - 13.0 SEC

TIME - 13.0 SEC

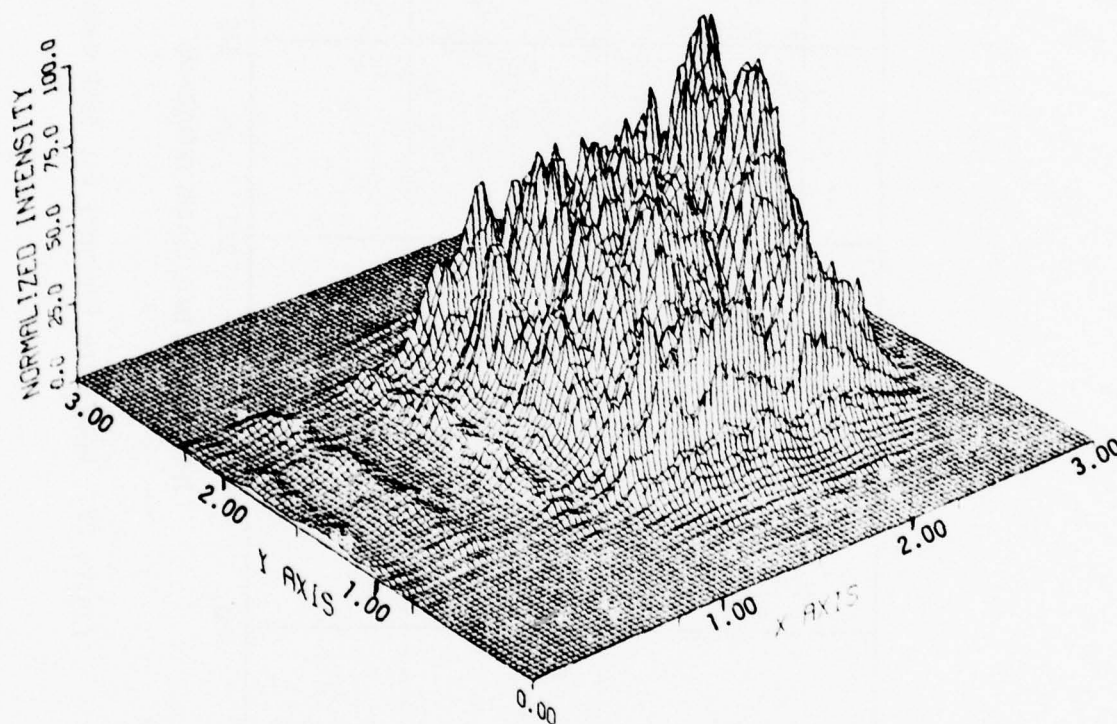


Figure 26. AGA 3-D Plot of HEL Beam Profile on Second Turning Mirror

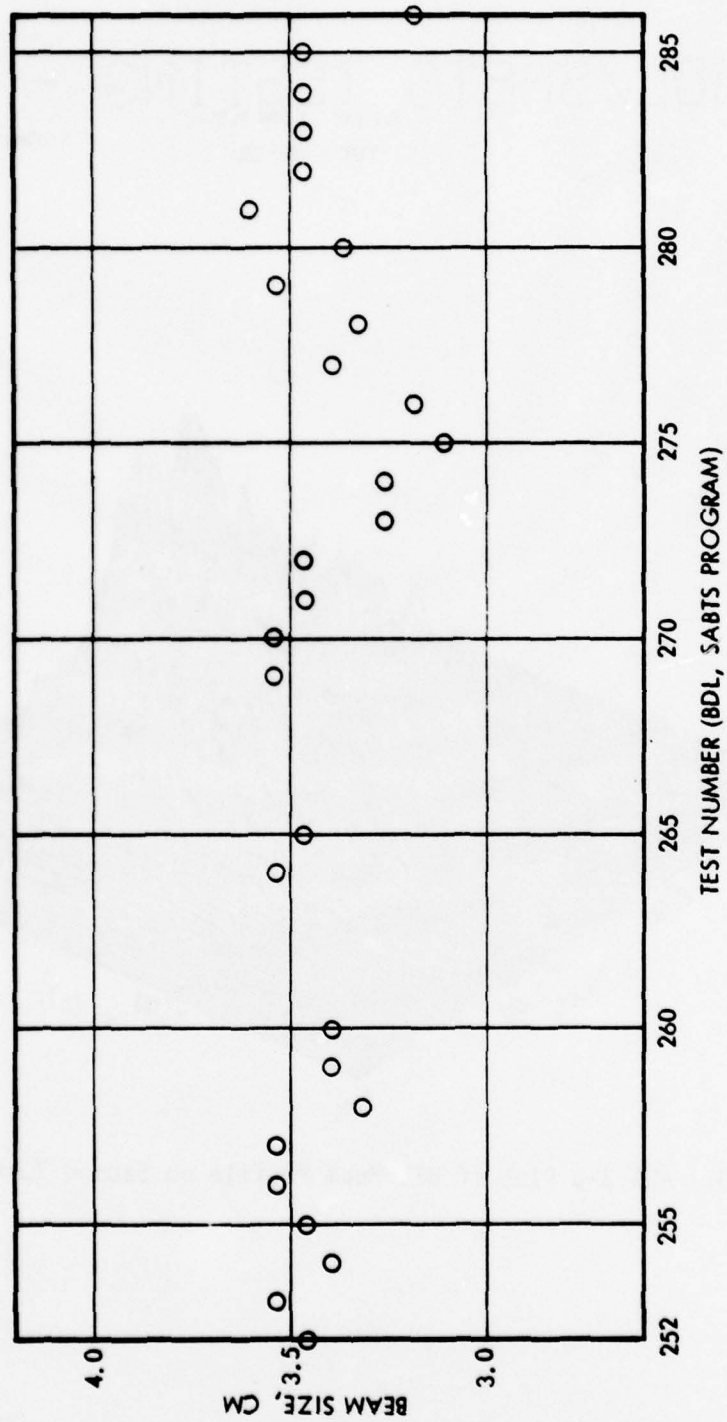


Figure 27. Beam Size (Height) vs. Test Number

A second measurement of beam size was made by measuring the amount of power reflected from the SABTS clipper into the BDL cone calorimeter and ratioing this to the total incident power on the clipper. These ratios for the various runs are presented in figure 28. They ranged in value from 0.13 to 0.26. The average ratio for the various points is 0.184. This is slightly better than the 0.24 fraction predicted by the EMBLAZONU calculations.

The third method of checking the beam size was made with an etching burned into a plexiglass sample by the HEL beam at the entrance to the SABTS beam conditioning cart. Measurements on the size of the etching, shown in figure 29, indicate the beam size to be 3.5 cm.

In addition to beam size, beam alignment was repeatedly monitored. Once the HeNe laser beam was aligned with the HEL beam via a plexiglass burn etching, subsequent checks of the BDL-SABTS optical train were made daily using the HeNe alignment beam. Additional checks were made whenever indicated. Further monitoring of the beam path was made from run to run by checking for any possible movement of the AGA HEL image. Additionally, continuous monitoring of the beam alignment was made by observing the clipped beam power from the SABTS clipper. Had misalignment occurred, it would have resulted in a sizeable increase in the clipped beam power. In general, the beam remained steady and little, if any, trimming of the optical train was required.

2. TEST OPERATIONS SUMMARY

Figures 30 and 31 summarize the SABTS operations and provide a quick comparison of program objectives with test accomplishments. In particular, figure 30 compares the estimated number of samples planned for testing with the number of samples that were actually irradiated. Test objectives for Phases II and III were 74 and 40 samples respectively for a total program objective of 114 specimens. Altogether, a total of 148 separate test opportunities were provided to SABTS. These test opportunities are defined as those planned specimen tests for which the HEL beam was fully available to the test system. From these opportunities, a total of 135 samples were actually tested by the SABTS. Differences between sample test opportunities

RATIO OF CONE CALORIMETER POWER VS TEST NUMBER
 $\left(\frac{\text{SABTS CLIPPER}}{\text{SLOW SHUTTER}} \right)$

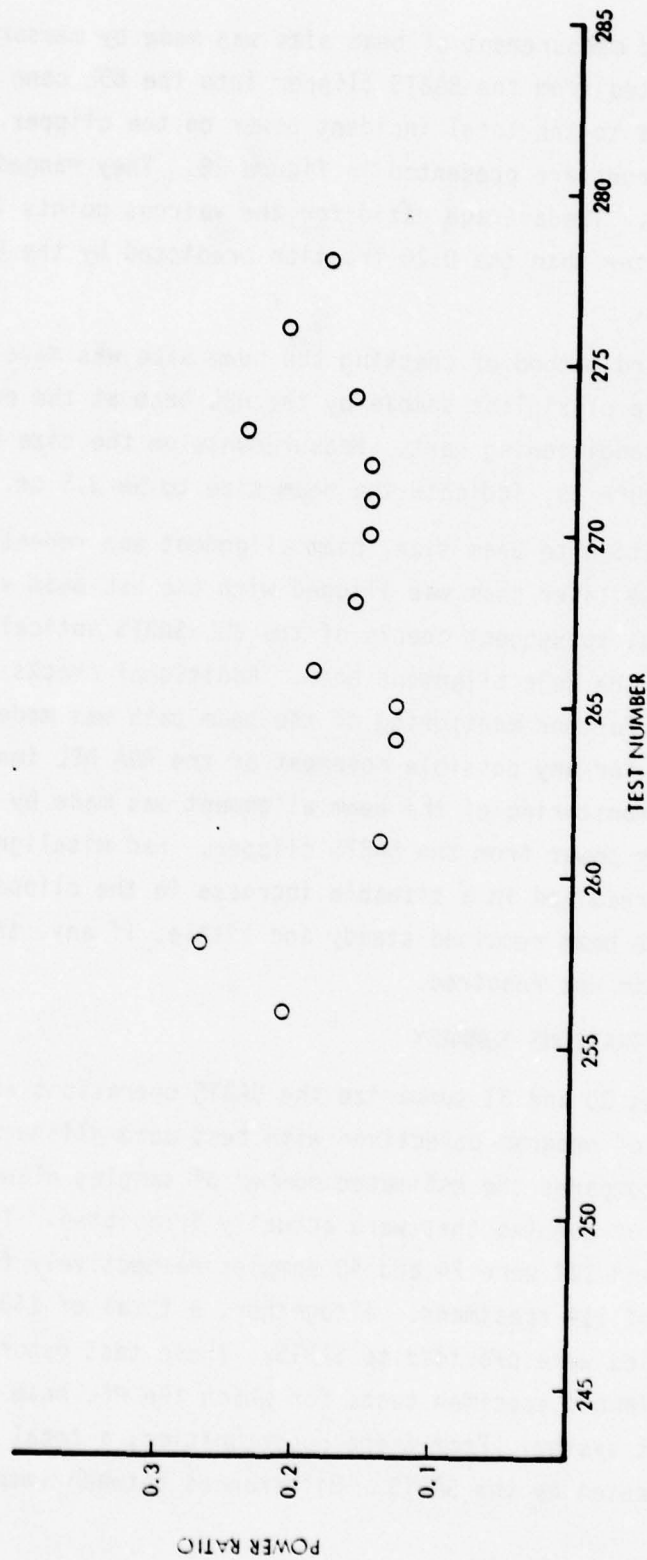


Figure 28. Power Ratio vs. Test Number

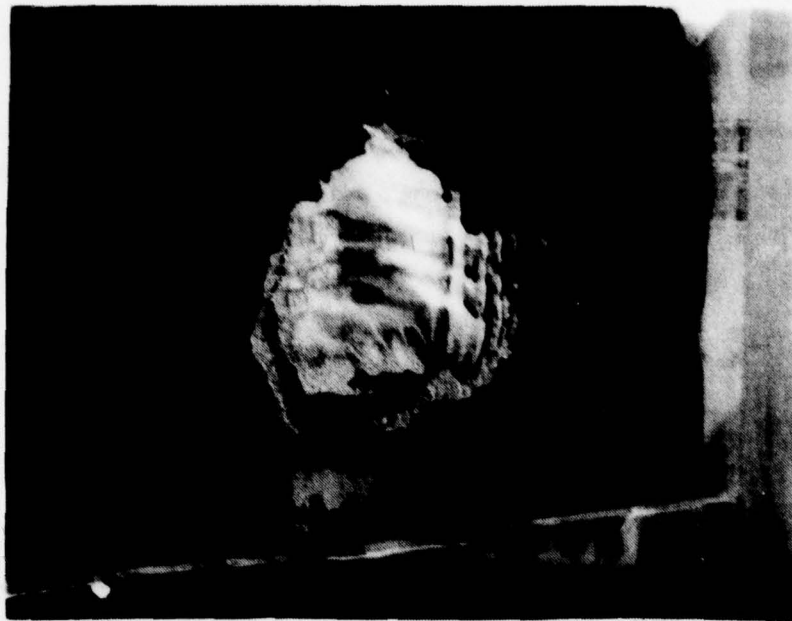
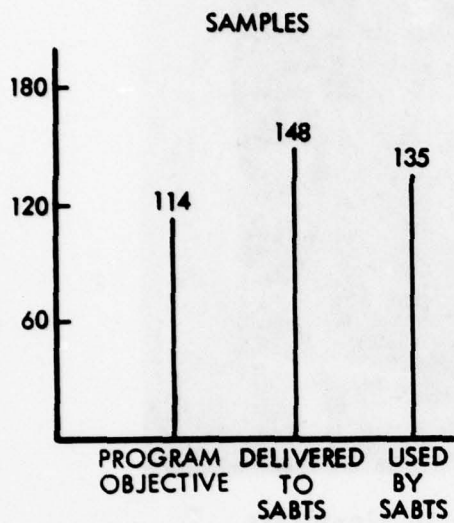


Figure 29. HEL Beam Etching in Plexiglass Sample

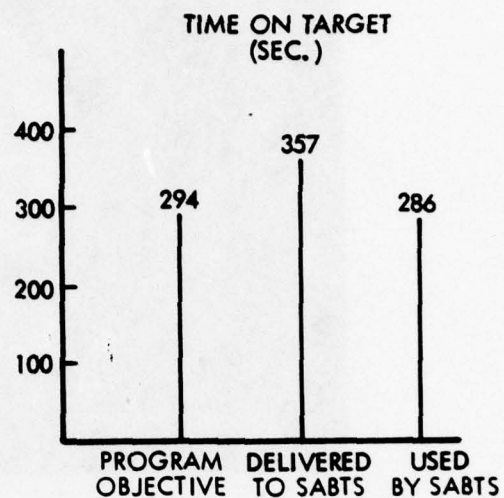
delivered to SABTS and sample test opportunities used by SABTS were caused by sample overrides or test shutdowns triggered by the SABTS itself. In any case, the total number of specimens actually tested was greater than had been planned.

Figures 30b and 30c make similar comparisons between the test objectives and test results for total time-on-target and total lasing device time. Figure 30b plots the total amount of time the specimens were irradiated while Figure 30c shows the total amount of time the BDL device was lasing. Once again, both parameters significantly exceeded the program objectives.

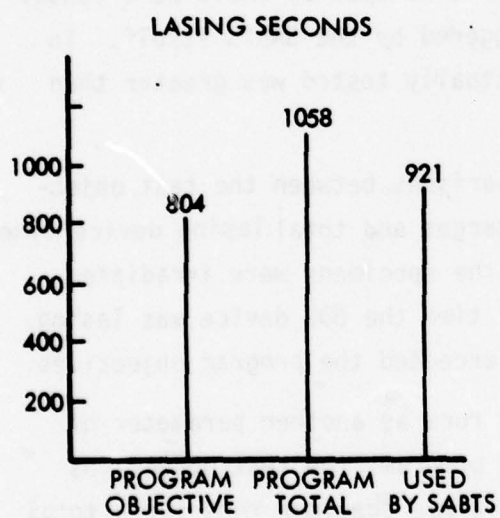
Figure 31 plots total number of laser runs as another parameter of test performance. At the beginning of the program, the test objectives included 42 single specimen runs and 12 multiple specimen runs for a total of 54 runs. The number of single versus multiple specimen runs was continually revised during the course of testing with a final end result of 25 multiple and 11 single specimen runs. This resulted in a total of 36 successful runs. However, since more multiple specimen runs were completed, the total number of specimens actually tested was greater than had been



(a)



(b)



(c)

Figure 30. SABTS Test Summary

LASING RUNS

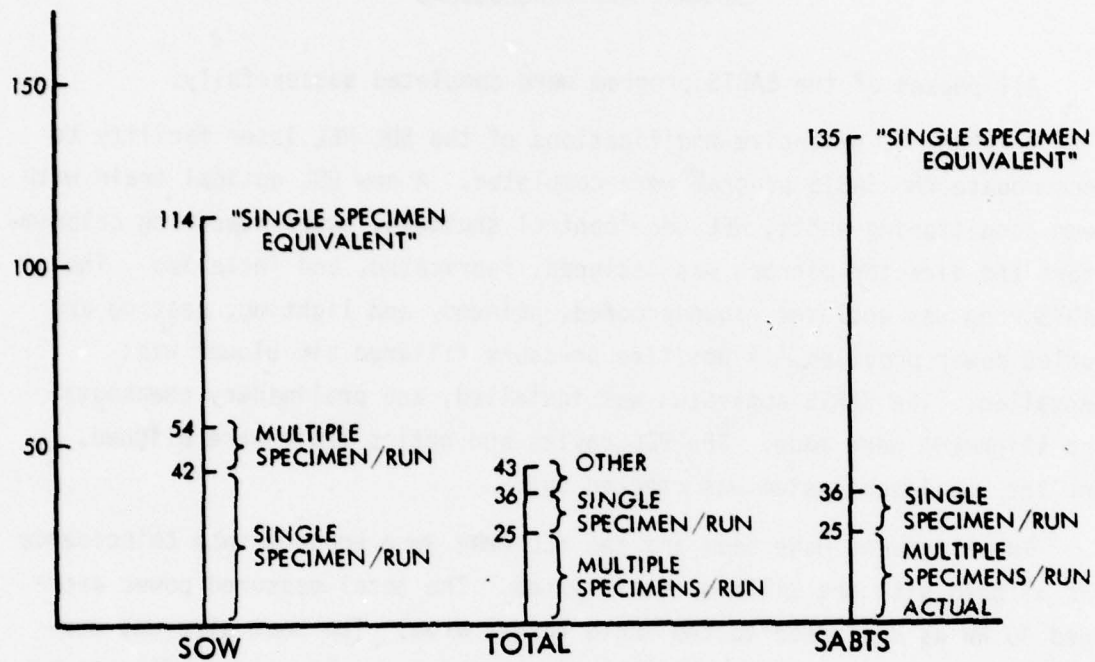


Figure 31. SABTS Lasing Runs Summary

planned. An additional seven runs were made during the test series which dealt with alignment and checkout and included several aborted runs.

Section VI

SUMMARY AND CONCLUSIONS

All phases of the SABTS program were completed successfully.

In Phase I, extensive modifications of the BDL HEL laser facility to accommodate the SABTS program were completed. A new BDL optical train with beam conditioning ducts, HEL beam control shutters, power measuring calorimeters and director mirrors was designed, fabricated, and installed. The SABTS room was enclosed, soundproofed, painted, and lighting, heating and outlet power provided. A positive pressure filtered air blower was installed. The SABTS apparatus was installed, and preliminary checkouts and alignment were made. The BDL cavity and optics train were aligned, and the BDL laser system was checked out.

The alignment HeNe beam and the HEL beam were brought into coincidence and aligned with the SABTS optical system. The total measured power averaged 40 kW as delivered to the SABTS target area. The beam size was measured in three different ways. All showed the beam size and profile to be within the test requirements.

The objectives of Phases II and III were also met successfully. The SABTS acceptance tests were completed, and all specifications which were verified in Phase I were maintained. From a test support point-of-view, all test goals were met or exceeded. For example, a total of 135 test specimens were irradiated by the beam. Only 114 samples had been planned. A total of 357 seconds of available time-on-target were delivered, compared to an estimated 294. Total lasing time for the program was 1058 seconds which can be compared to the 804 seconds estimated at the beginning of the program. In addition, an Add-On Effects Test was successfully integrated and operated for the duration of the Phase III test series.

The following recommendations are made for future tests:

A modification of the experiment to accommodate more specimens per run would allow longer run times and the same data to be obtained in fewer runs with substantial savings. Once a run is started, the additional

effort for a 120 second run versus a 5 second run is relatively insignificant.

In addition, redundancy in data instrumentation can serve to improve successful data collection. Duplication of equipment, and design of parallel data acquisition systems can reduce effects of equipment malfunction and operator error.

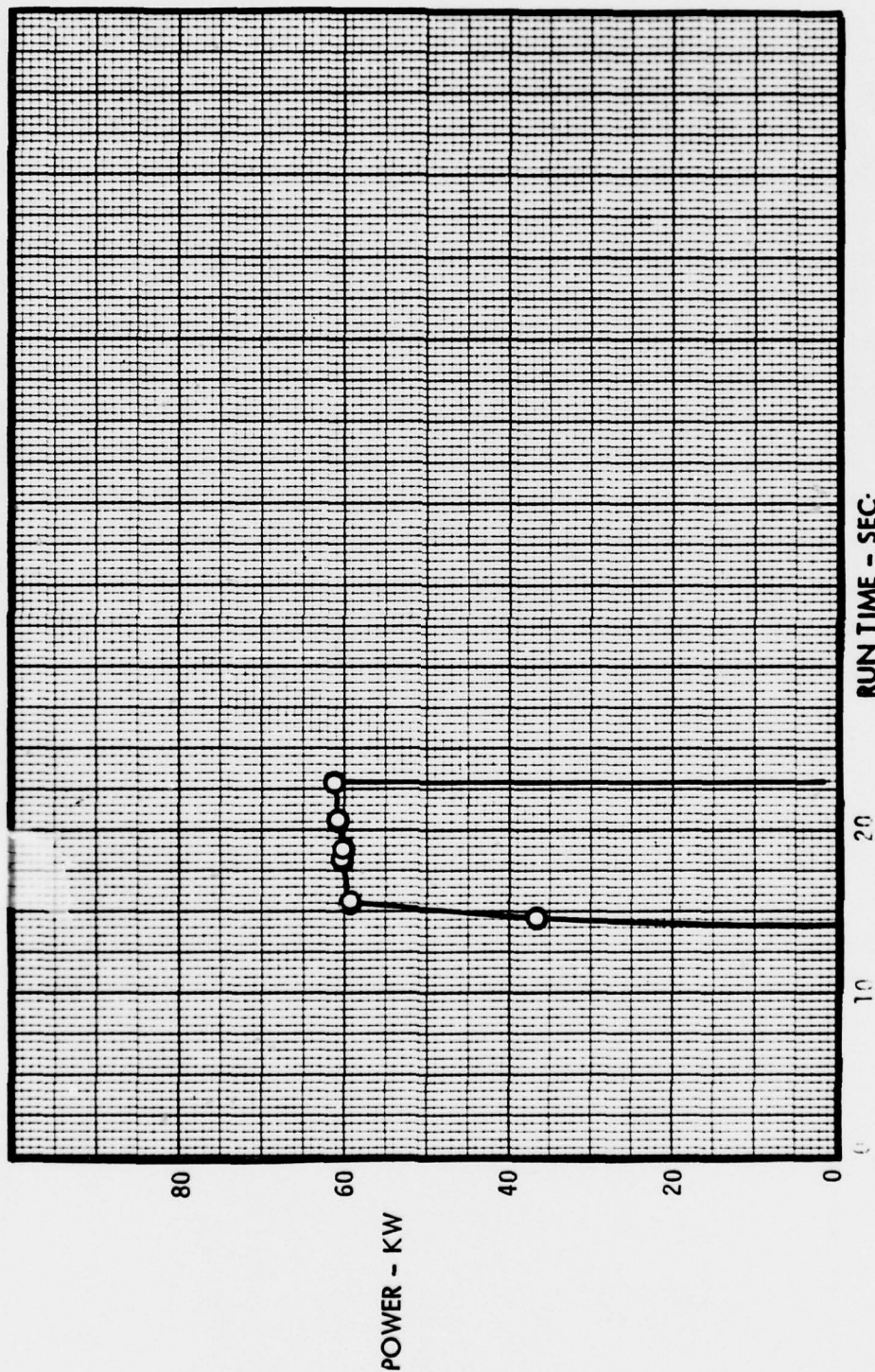
Detailed test plans with integrated design, procedures and check lists could also be utilized to good effect. These items serve to develop the most efficient path through a testing matrix and to optimize test activities relative to the program's schedule.

APPENDIX

This appendix contains three data sheets for each of the 43 tests in the SABTS series (BDL tests VL1-245 through VL1-287). These data sheets are: (1) Estimated Power versus Time, (2) Planned Time Lines and Quick Look Data Sheet, and (3) Beam Intensity Profile. The first sheet is a plot of device power (kW) versus run time (sec). For the first two tests total device power is determined by summing the power measured at the slow shutter calorimeter and that measured at the fang clipper. The calorimeter at the fang clipper was removed (and placed at the SABTS clipper) in favor of an uninstrumented power dump after the second test. Total power from the third test (VL1-247) to the end of the series was calculated from the power measured at the slow shutter calorimeter using a factor developed from the first two tests. The second sheet, Planned Time Lines ..., indicates the planned and actual sequencing during the tests as well as providing specimen information and exposure times. The Beam Intensity Profile (photos) is that seen by the IR (AGA) camera located at the second turning flat mirror (just upstream of the slow shutter).

USER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-245

ESTIMATED POWER VS. TIME



REMARKS: 0.7 SEC PLEXIGLASS BURN (AT ENTRANCE TO SABTS

TEST AREA) @ APPROX 18.6 SECONDS.

PREPARED BY:

L. S. Jones

1-16-77

BEAM INTENSITY PROFILE

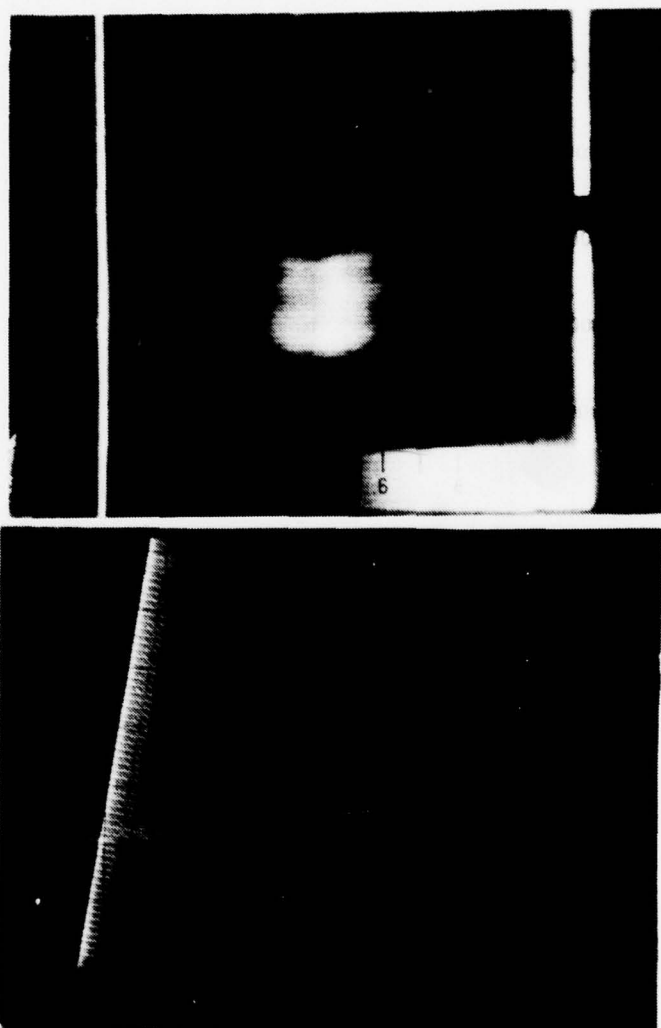
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) +16

LINEAR PROFILE*

APPROX. TIME (SEC) +16

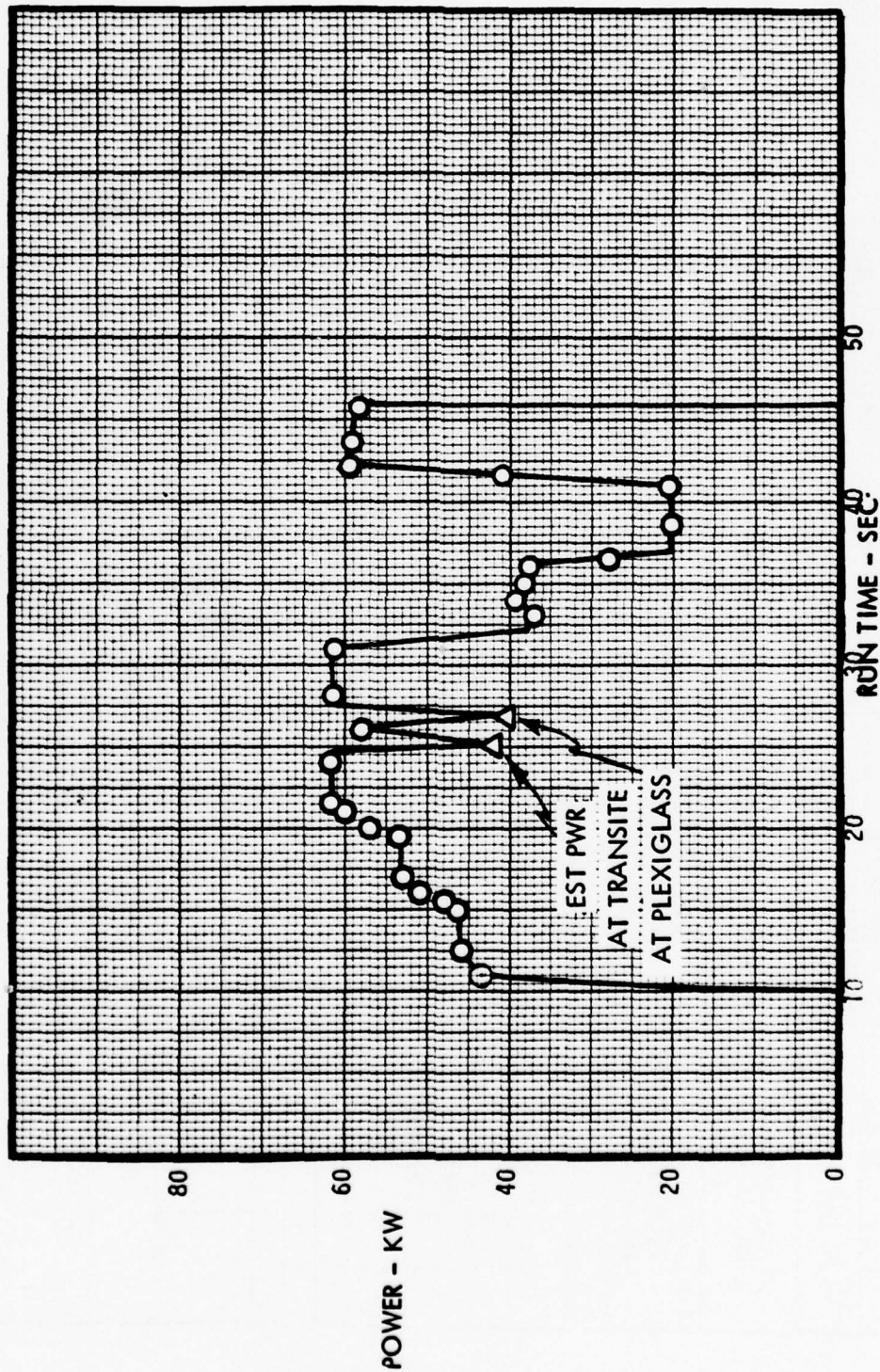


*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LFF BERGERSON
BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-246

ESTIMATED POWER VS. TIME



REMARKS: F2 SCAN WITH TRANSITE & PLEXIGLASS BURNS IN THE

SABTS TEST AREA.

PREPARED BY:

L. Saks
1-12-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA				
RUN NO.	TEST PLAN	DATE	TIME	
VLL-246	SABTS	1-11-77	2100	
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	LASING DURATION (SEC)	TOTAL COMPLETED TEST POSITIONS	PLANNED TOTAL PWR.
10	45.8	35.8	2	67
PLANNED TEST NO. R-2		TIME LINES	AS OF	DATE 1/1-77 REVISION C

EXPERIMENTER	PLANNED LINEAR MAGNIFICATION	CONFIGURATION
T. ROZKHART	DNA	<input type="checkbox"/> REFLECTIVE
W. BALL	PLANNED PLAK PWR DENSITY	<input type="checkbox"/> TRANSMISSIVE
	DNA	

		PLANNED			ACTUAL					
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	PLEXI		1.0		26.0	23.7	45.5	61.8		
2	TRANS		0.7		27.4	29.9	45.5	61.7		
3										
4										
5										
6										

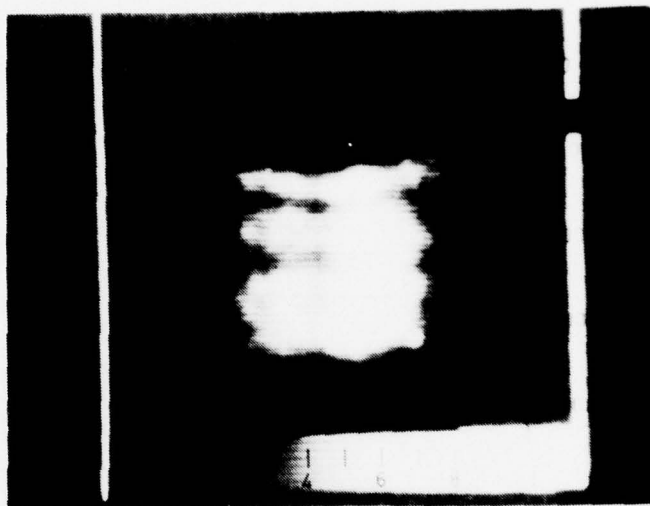
ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAF	N/A	48.0
No. 2	ON		SANGAMO No. 1	6.0	
No. 3			SANGAMO No. 2	N/A	
No. 4			SABTS SEQ.	N/A	
SABTS INST.	N/A		CALORIMETER (FANG)	10.0	46.0
			CALORIMETER (SLOW SHUTTER)	10.0	26.0
			" "	27.4	46.0

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

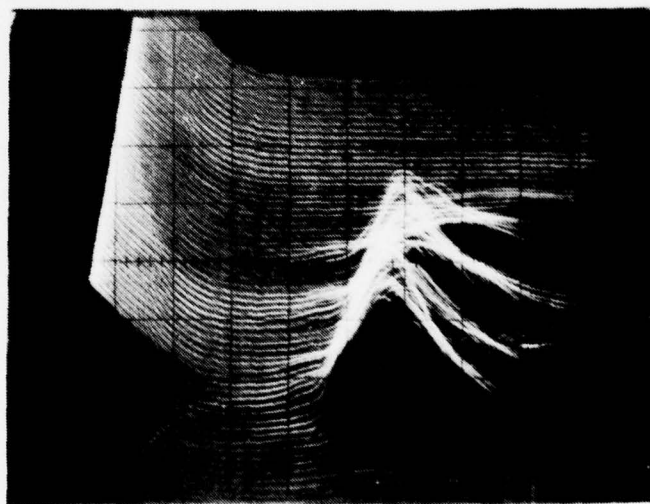
TOTAL INTENSITY

APPROX. TIME (SEC) + 20



LINEAR PROFILE*

APPROX. TIME (SEC) + 20

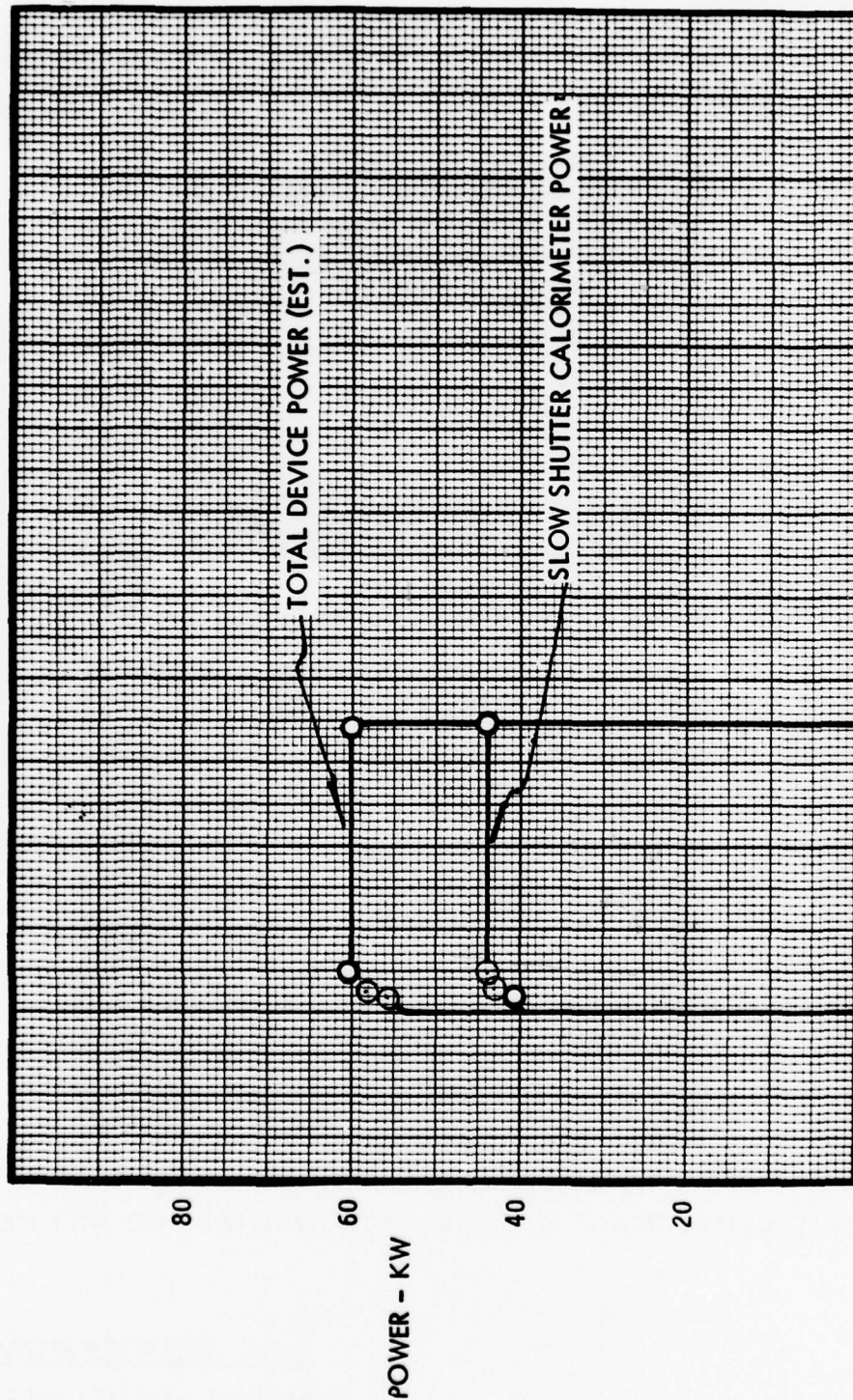


*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

ESTIMATED POWER VS. TIME



REMARKS: BEAM DIRECTED TO SLOW SHUTTER CALORIMETER FOR

ENTIRE TEST (SLOW SHUTTER DID NOT OPEN).

PREPARED BY:

L. Sings
1-14-77

REV: 1-19-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME							
YLI-247	SABTS	1-13-77	2320							
D2 FIRE VALVE OPEN (SEC)	10.4	D2 FIRE VALVE CLOSED (SEC)	27.3	LASING DURATION (SEC)	16.9	TOTAL COMPLETED TEST POSITIONS	0	PLANNED TOTAL PWR.	62	
PLANNED TEST NO. FAT-1 TIME LINES				AS OF		DATE 1-12-77 REVISION CRIG				
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		CONFIGURATION						
D. MULLEN		PLANNED PEAK PWR DENSITY 10 KW		<input type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE						
PLANNED						ACTUAL				
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	#1 PLEX		.25	1.10	14.00					
2	#2		.25	1.10	15.35					
3	#3		.25	1.10	16.70					
4	#4		.25	1.10	18.05					
5	#5		.25	1.10	19.40					
6	#1 PLEX		3.00		20.75					
					23.75					
NOTE: SLOW SHUTTER DID NOT OPEN						26.3		60.2		
ITEM	START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)				
TV CAMERA No. 1	ON		O-GRAPH		MANUAL	MANUAL				
No. 2	ON		SANGAMO No. 1		6.0	29.0				
No. 3	ON		SANGAMO No. 2		N/A					
No. 4	ON		SABTS SEQ.		14.0	23.75				
			CALORIMETER (SABTS)		14.0	23.75				
SABTS INST.			CALORIMETER (SLOW SHUTTER)		10.0	14.0				
HI FLOW SOLENOID	10.0	26.75	" "	" "	23.75	26.75				

* SABTS BALL CALORIMETER REF: TCR GT 21360 PAGE 3 OF 4

LASER PERFORMANCE ANALYSIS, RUN VLI-247

BEAM INTENSITY PROFILE

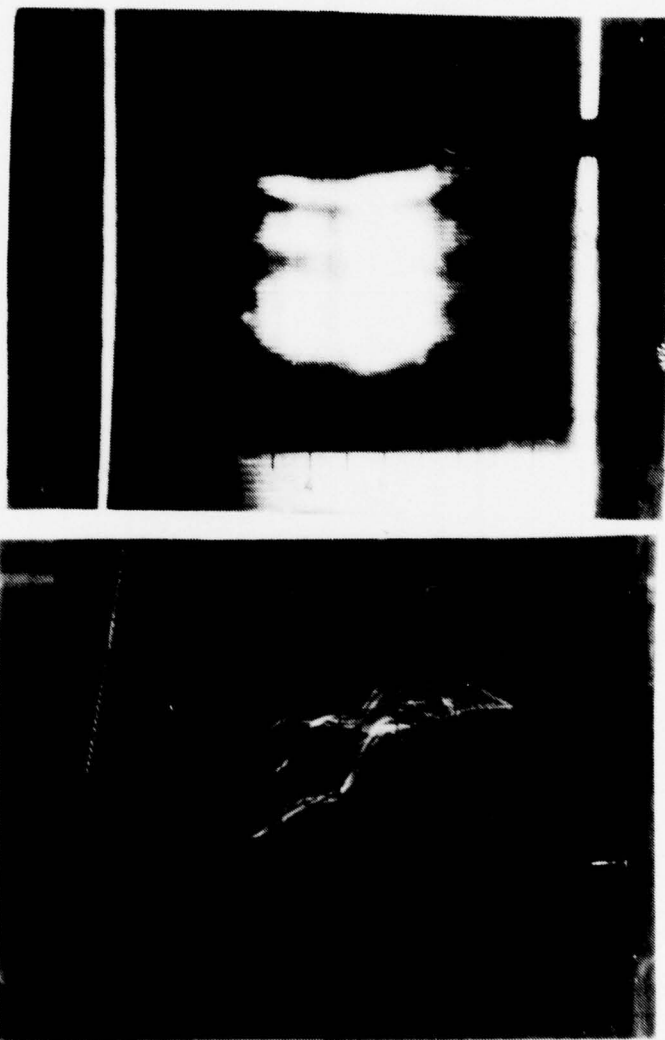
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 10

LINEAR PROFILE*

APPROX. TIME (SEC) 10



*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA			
RUN NO. VLI-248	TEST PLAN SABTS	DATE 1-14-77	TIME 1848
D2 FIRE VALVE OPEN (SEC) 10.4	D2 FIRE VALVE CLOSED (SEC) 27.3	LASING DURATION (SEC) 16.9	TOTAL COMPLETED TEST POSITIONS 1
			PLANNED TOTAL PWR. 62

PLANNED TEST NO. **PAT-1** TIME LINES **AS OF** DATE **1-14-77** REVISION **A**

EXPERIMENTER D. MULLEN	PLANNED LINEAR MAGNIFICATION PLANNED PEAK PWR DENSITY 10 KW/CM²	CONFIGURATION <input type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE
----------------------------------	--	---

PLANNED						ACTUAL			COMMENTS
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	
1	#1 PLEY		.25	1.10	14.00	12.5	16.5		
2	#		.25	1.10	15.35	NOTE: ALIGNMENT PRISM IN PATH OF BEAM.			
3	#		.25	1.10	16.70				
4	#		.25	1.10	18.05				
5	#		.25	1.10	19.40				
6	#1 PLEY		3.00		20.75				
					23.75				
NOTE: BURN THRU WIRE STOPPED TEST AFTER FIRST TEST POSITION.									

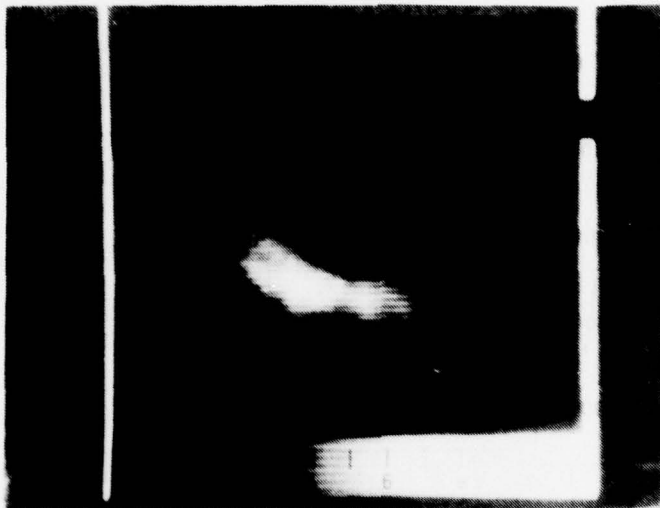
ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH	MANUAL	MANUAL
No. 2	ON		SANGAMO No. 1	6.0	29.0
No. 3	ON		SANGAMO No. 2	N/A	
No. 4	DN		SABTS SEQ.	14.0	23.75
			CALORIMETER (SABTS)	14.0	23.75
SABTS INST.			CALORIMETER (SLOW SHUTTER)	10.0	14.0
HI FLOW SOLENOID	10.0	27.75	" " "	23.75	27.75

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

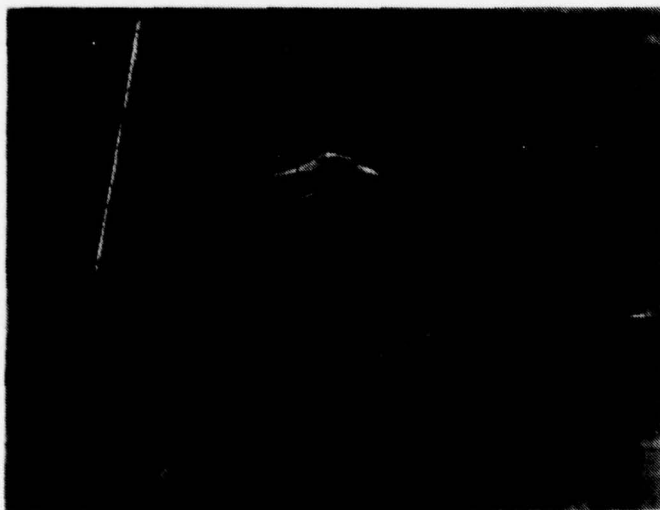
TOTAL INTENSITY

APPROX. TIME (SEC) 20.0



LINEAR PROFILE*

APPROX. TIME (SEC) 20.0



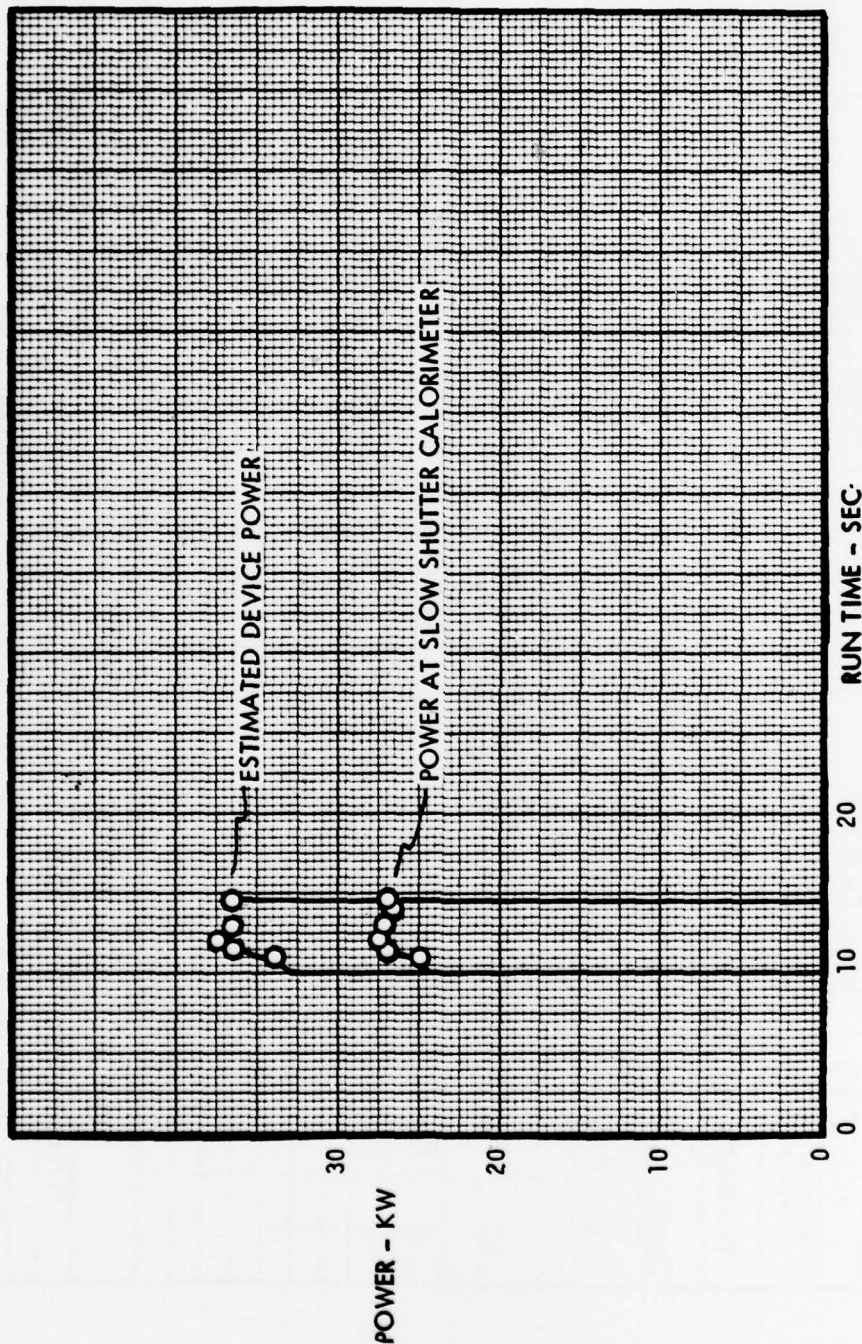
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-249

ESTIMATED POWER VS. TIME



REMARKS: TEST TERMINATED DUE TO LOWER POWER. F2 SCAN &

PLEX BURN NOT COMPLETED

PREPARED BY:

J. S. NGAS

1-19-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA			
RUN NO. VLI-249	TEST PLAN SABTS	DATE 1-18-77	TIME 1957
D2 FIRE VALVE OPEN (SEC) 10.4	D2 FIRE VALVE CLOSED (SEC) 14.5	LASING DURATION (SEC) 4.1	TOTAL COMPLETED TEST POSITIONS 0
PLANNED TEST NO. R-3		DATE 1-17-77	
TIME LINES		REVISION A	
PLANNED TOTAL PWR. 67			

EXPERIMENTER J. ROSZMART	PLANNED LINEAR MAGNIFICATION	CONFIGURATION
W. BALL	PLANNED PEAK PWR DENSITY	<input type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE

		PLANNED				ACTUAL				
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	PLEX		0.7		24.0	13.0		27.1		
2										
3										
4										
5										
6										
	</									

64

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH	N/A	
No. 2			SANGAMO No. 1	6.0	37.0
No. 3			SANGAMO No. 2	N/A	
No. 4			SABTS SEQ.	N/A	
			CALORIMETER (SABTS)	N/A	
SABTS INST.	N/A		CALORIMETER (SLOW SHUTTER)	10.0	24.0
			" "	24.7	35.0

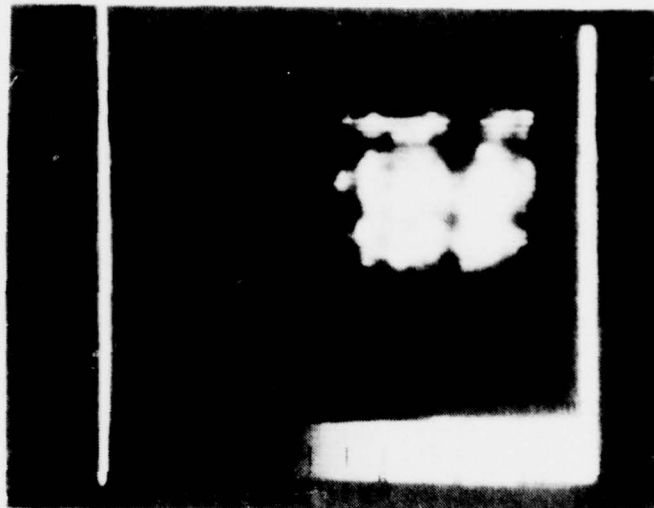
LASER PERFORMANCE ANALYSIS, RUN VL1-249

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

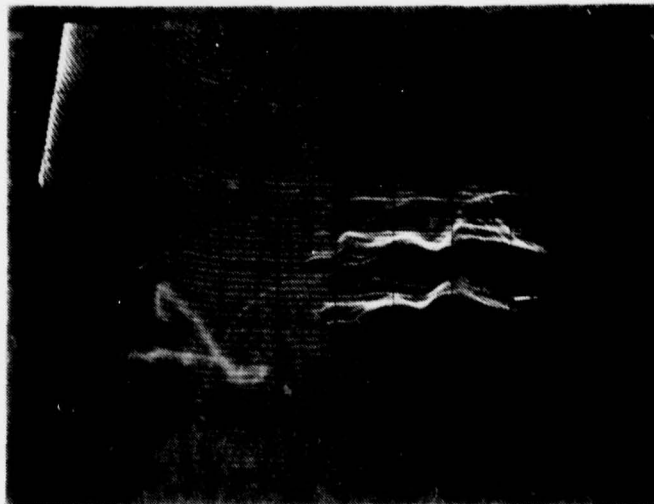
TOTAL INTENSITY

APPROX. TIME (SEC) 12.0



LINEAR PROFILE*

APPROX. TIME (SEC) 12.0



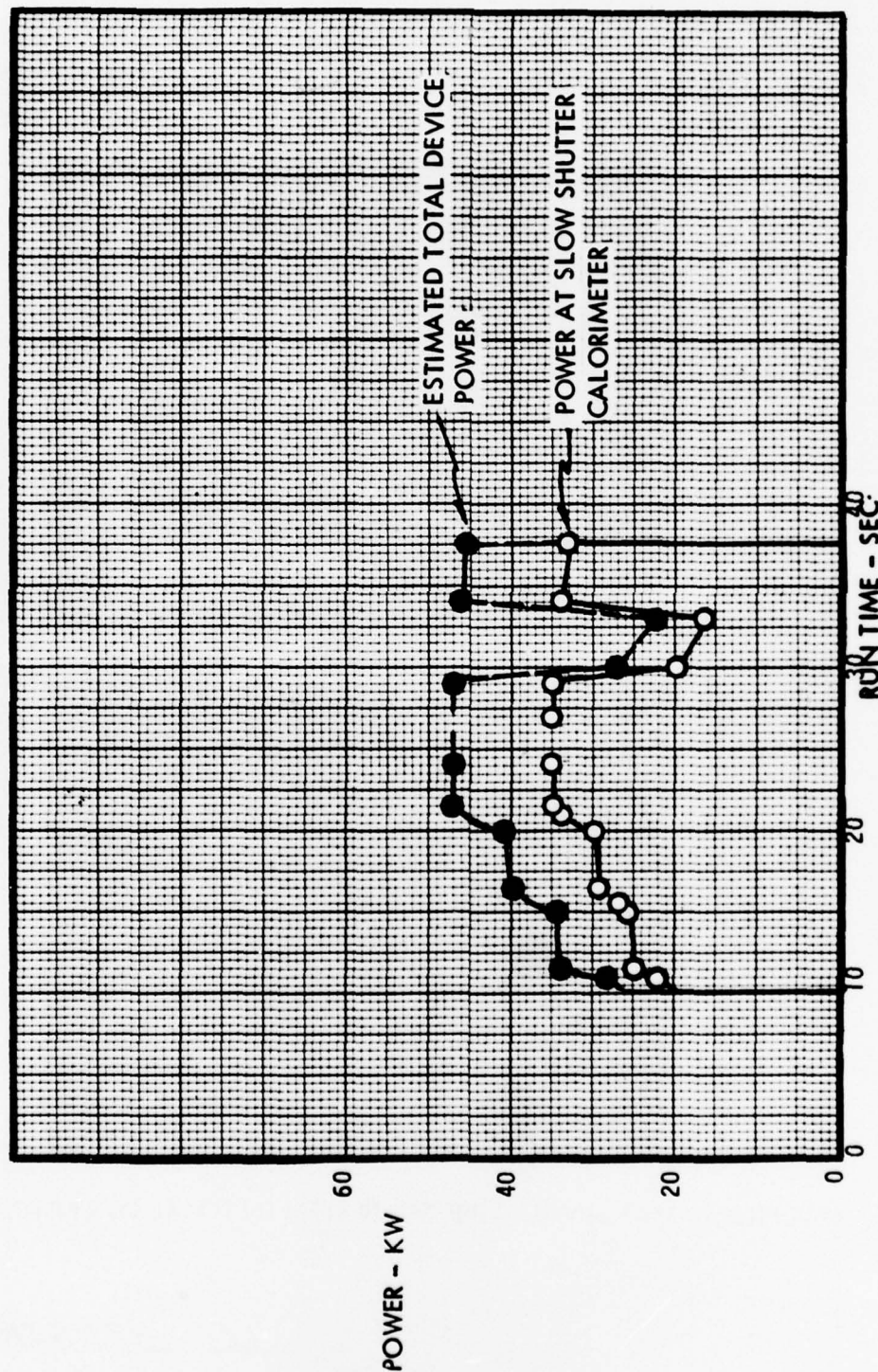
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-250

ESTIMATED POWER VS. TIME



REMARKS: F2 SCAN WITH PLEXIGLASS BURN AT ~ 25 SEC.

PREPARED BY:

J. Sings

1-19-77

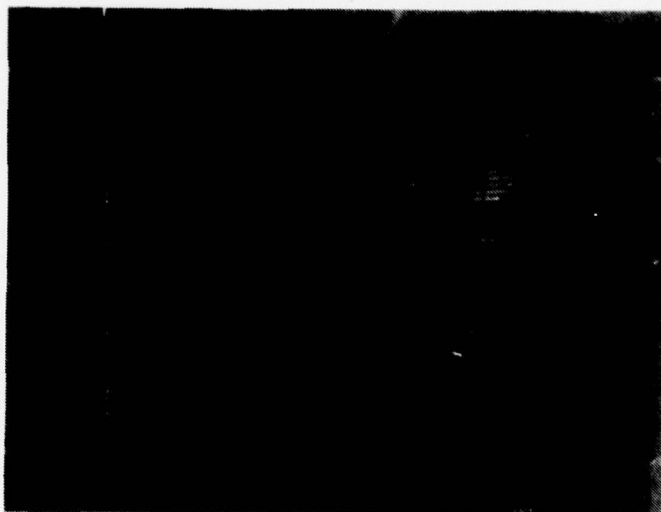
LASER PERFORMANCE ANALYSIS, RUN VLI-250

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

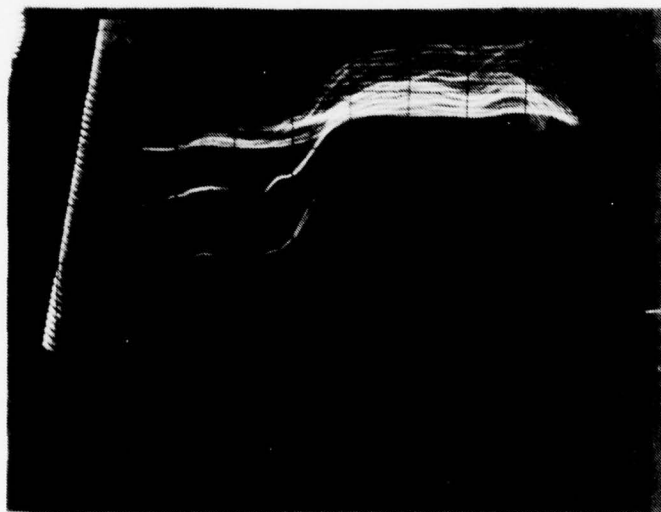
TOTAL INTENSITY

APPROX. TIME (SEC) 18.0



LINEAR PROFILE*

APPROX. TIME (SEC) 18.0



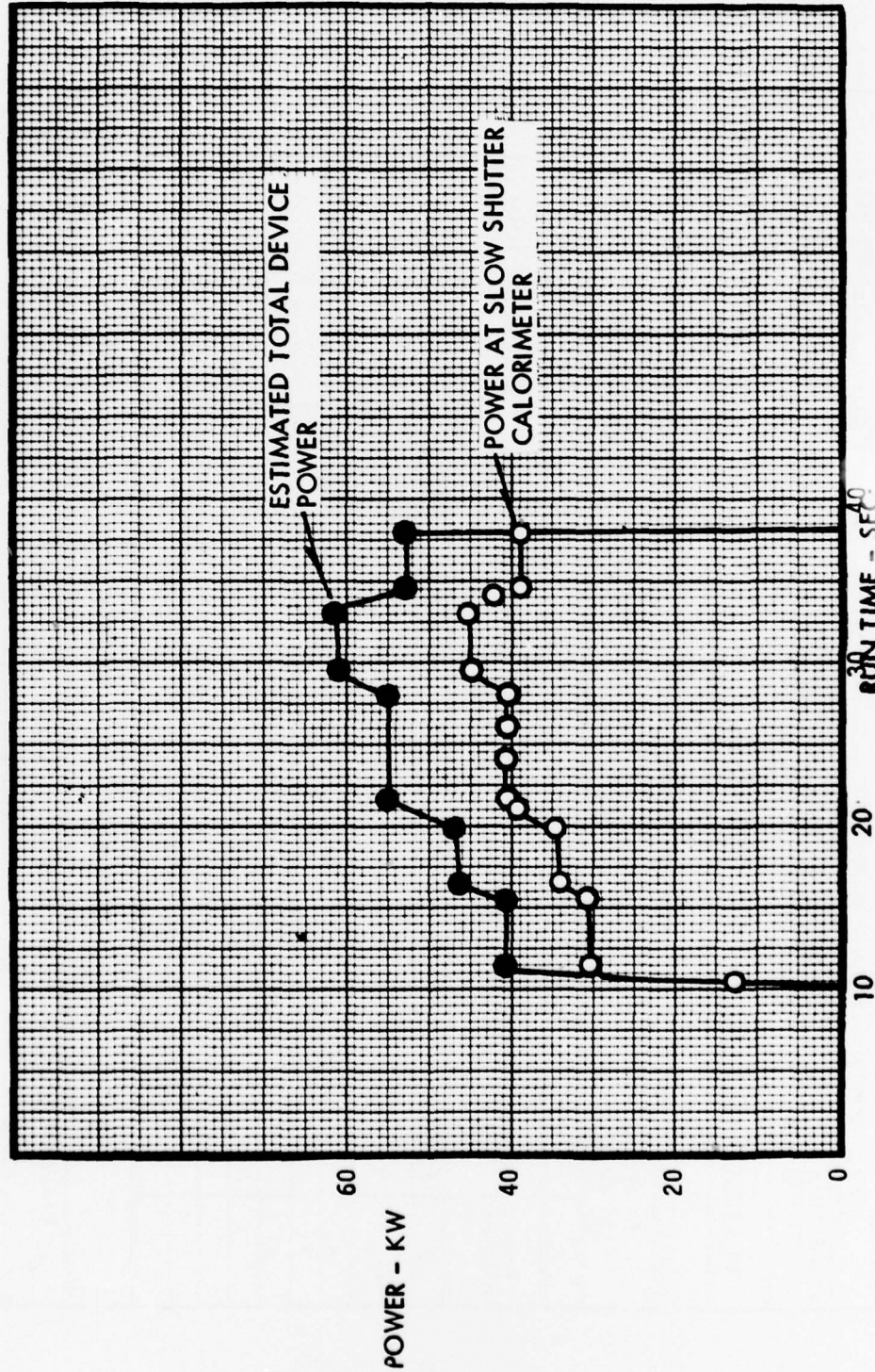
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-251

ESTIMATED POWER VS. TIME



REMARKS: F₂ SCAN WITH PLEXIGLASS BURN @ ~ 25 SECONDS.

PREPARED BY:

L. Swags
1-20-77

[illegible]

REF: TCR ML 21361

PAGE 3 OF 4

LASER PERFORMANCE ANALYSIS, RUN VL1-251

BEAM INTENSITY PROFILE

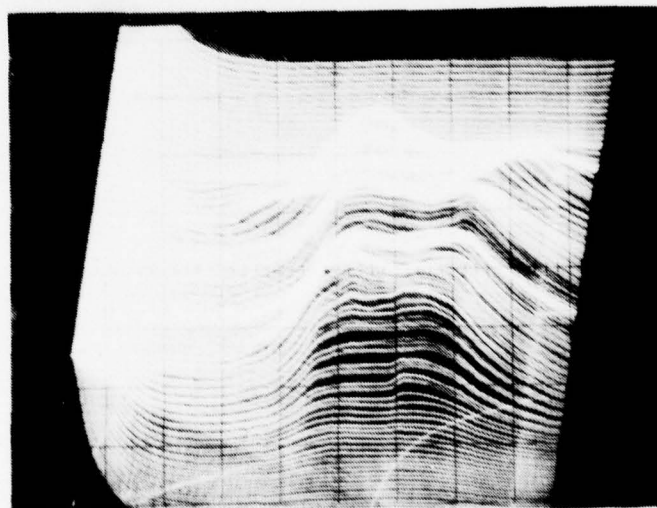
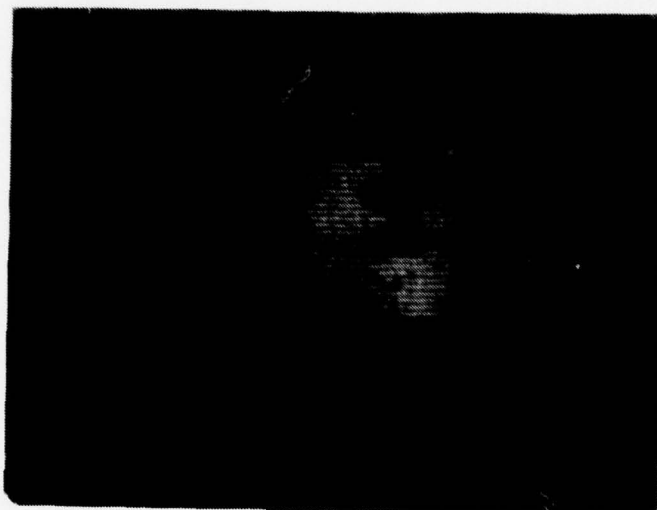
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) 20



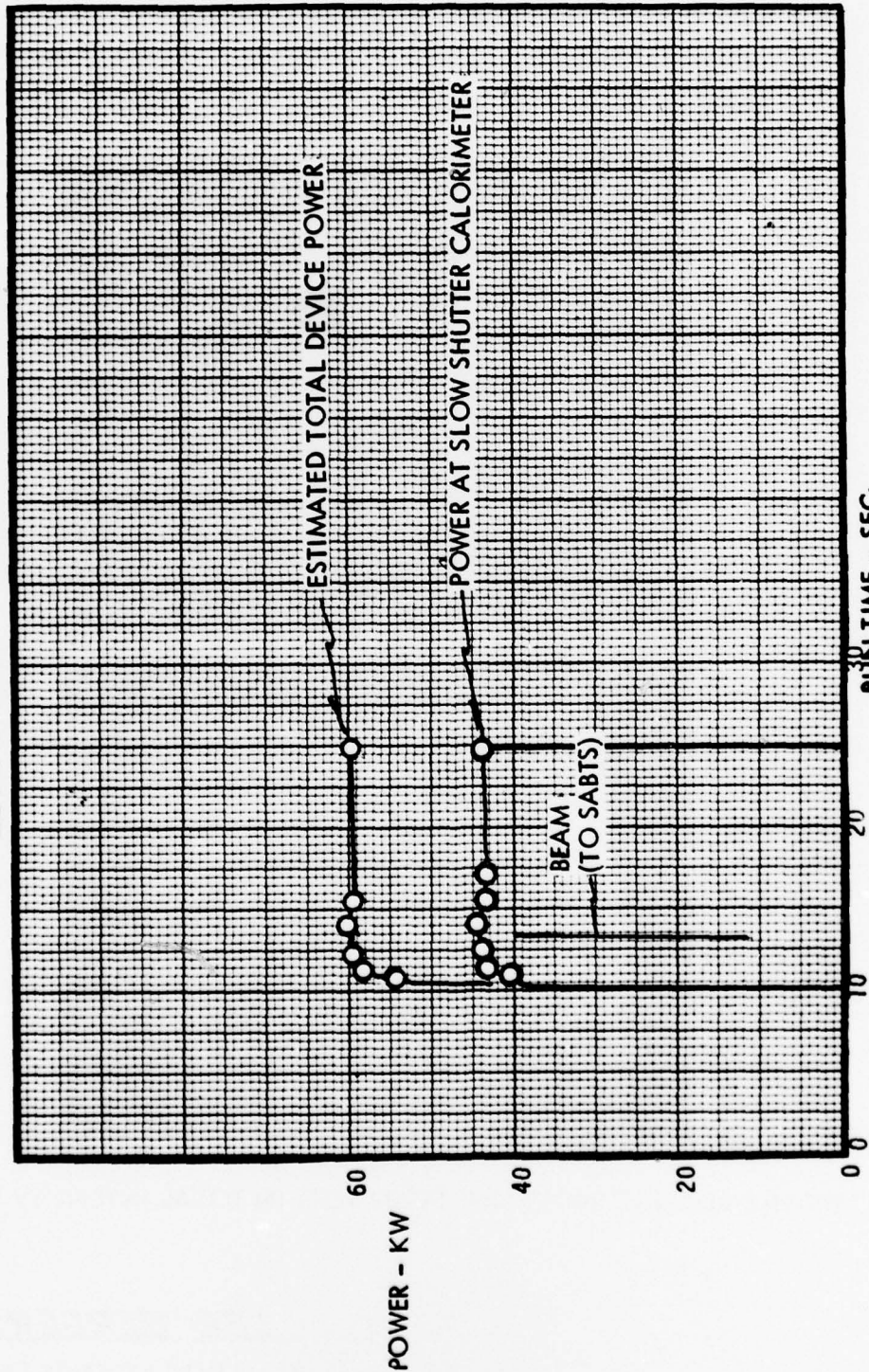
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL1-252

ESTIMATED POWER VS. TIME



REMARKS: SABTS EXPERIMENT TERMINATED AFTER 1st BURN.

PREPARED BY:

L. Seales
1-21-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME	DATE 1-19-77		REVISION	B			
VLI-252	SABTS	1-21-77	1734							
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	24.8	LASING DURATION (SEC)	14.4	TOTAL COMPLETED TEST POSITIONS	59				
PLANNED TEST NO. FAT-2 TIME LINES AS OF DATE 1-19-77 REVISION B										
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		CONFIGURATION						
D. MULLEN		PLANNED PEAK PWR DENSITY 40-45 KW/CM ²		<input type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE						
PLANNED						ACTUAL				
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	# 1 PLEX		.25	1.10	14.00	14.0	44.0			
2	#		.25	1.10	15.35					
3	#		.25	1.10	16.70					
4	#		.25	1.10	18.05					
5	#		.25	1.10	19.40					
6	# 1 PLEX		3.00		20.75					
NOTE: "SPIDER" DETECTOR STOPPED TEST AFTER 1ST SPECIMEN										
ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)					
TV CAMERA No. 1	ON		O-GRAPH	MANUAL	MANUAL					
No. 2	ON		SANGAMO No. 1	6.0	29.0					
No. 3	ON		SANGAMO No. 2	N/A						
No. 4	ON		SABTS SEQ.	14.0	23.75					
			CALORIMETER (SABTS)	14.0	23.75					
SABTS INST.			CALORIMETER (SLOW SHUTTER)	10.0	14.0					
HI FLOW SOLENOID	10.0	27.75	" " "	23.75	27.75					

LASER PERFORMANCE ANALYSIS, RUN VL1-252

BEAM INTENSITY PROFILE

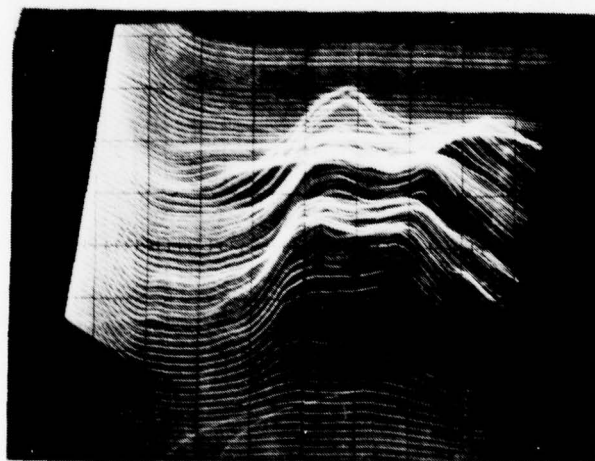
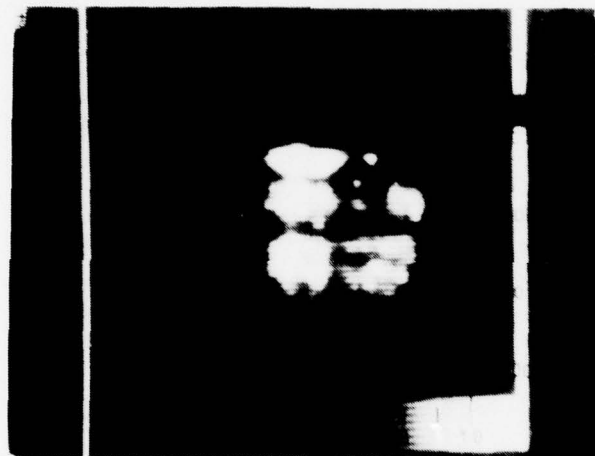
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) 20

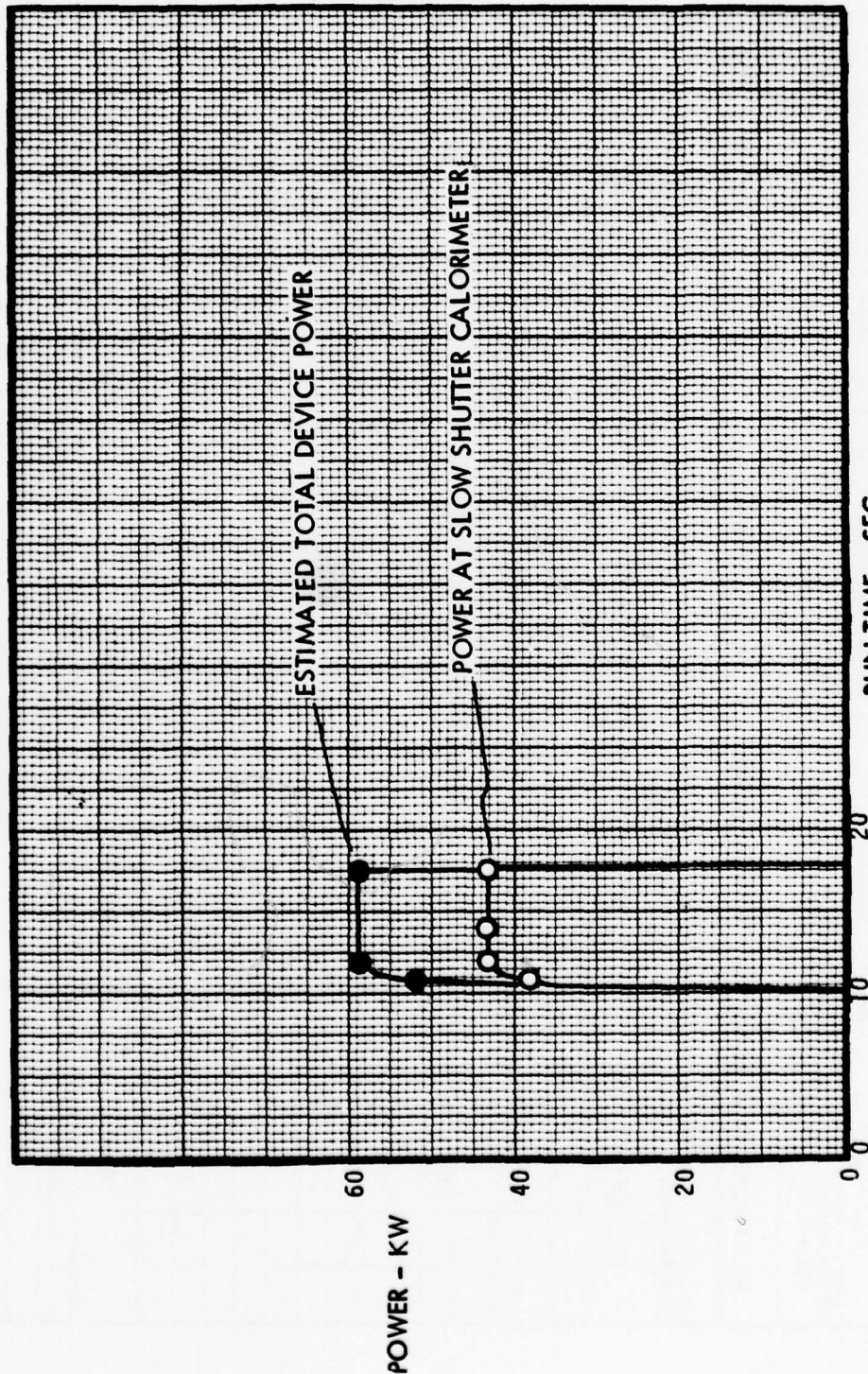


*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON
BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-253

ESTIMATED POWER VS. TIME



REMARKS: Plexiglass Burn Through SABTS Cart (0.25sec)

@ 14. + Sec.

PREPARED BY:

J. SINGH
1-22-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

PLANNED TIME LINES AND QUICK LOOK DATA SHEET										
QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME							
VLI-253	SABTS	1-21-77	2211							
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	LASING DURATION (SEC)	TOTAL COMPLETED TEST POSITIONS	PLANNED TOTAL PWR. 59						
10.4	17.6	7.2	1							
PLANNED TEST NO. FAT-3 TIME LINES AS OF DATE 1-21-77 REVISION ORIG										
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION	CONFIGURATION							
D. MULLEN		PLANNED PEAK PWR DENSITY 40-45 KW/CM ²	<input type="checkbox"/> REFLECTIVE							
			<input type="checkbox"/> TRANSMISSIVE							
PLANNED			ACTUAL							
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	PLEX		.25		14.00	14.0	43.5			PLEX IN FRT OF CONVEX MIRROR
2					14.25					
3										
4										
5										
6										
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		ON		O-GRAPH		MAN.	MAN.			
No. 2		"		SANGAMO No. 1		6.0	20.0			
No. 3		"		SANGAMO No. 2		N A				
No. 4		"		SABTS SEQ.		14.0	14.25			
				CALORIMETER (SABTS)		14.0	14.25			
SABTS INST.				CALORIMETER (SLOW SHUTTER)		10.0	14.00			
HI FLOW SOLENOID		10.0	17.75	"		14.25	17.75			

LASER PERFORMANCE ANALYSIS, RUN VLI-253

BEAM INTENSITY PROFILE

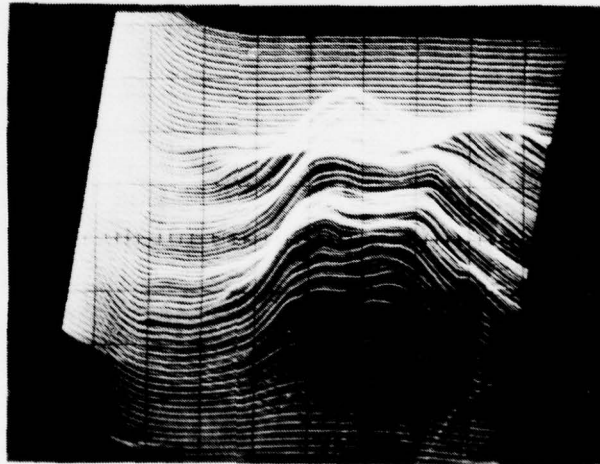
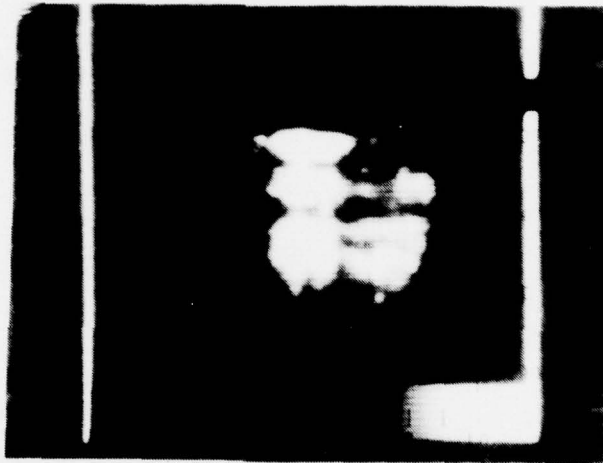
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 14.0

LINEAR PROFILE*

APPROX. TIME (SEC) 14.0



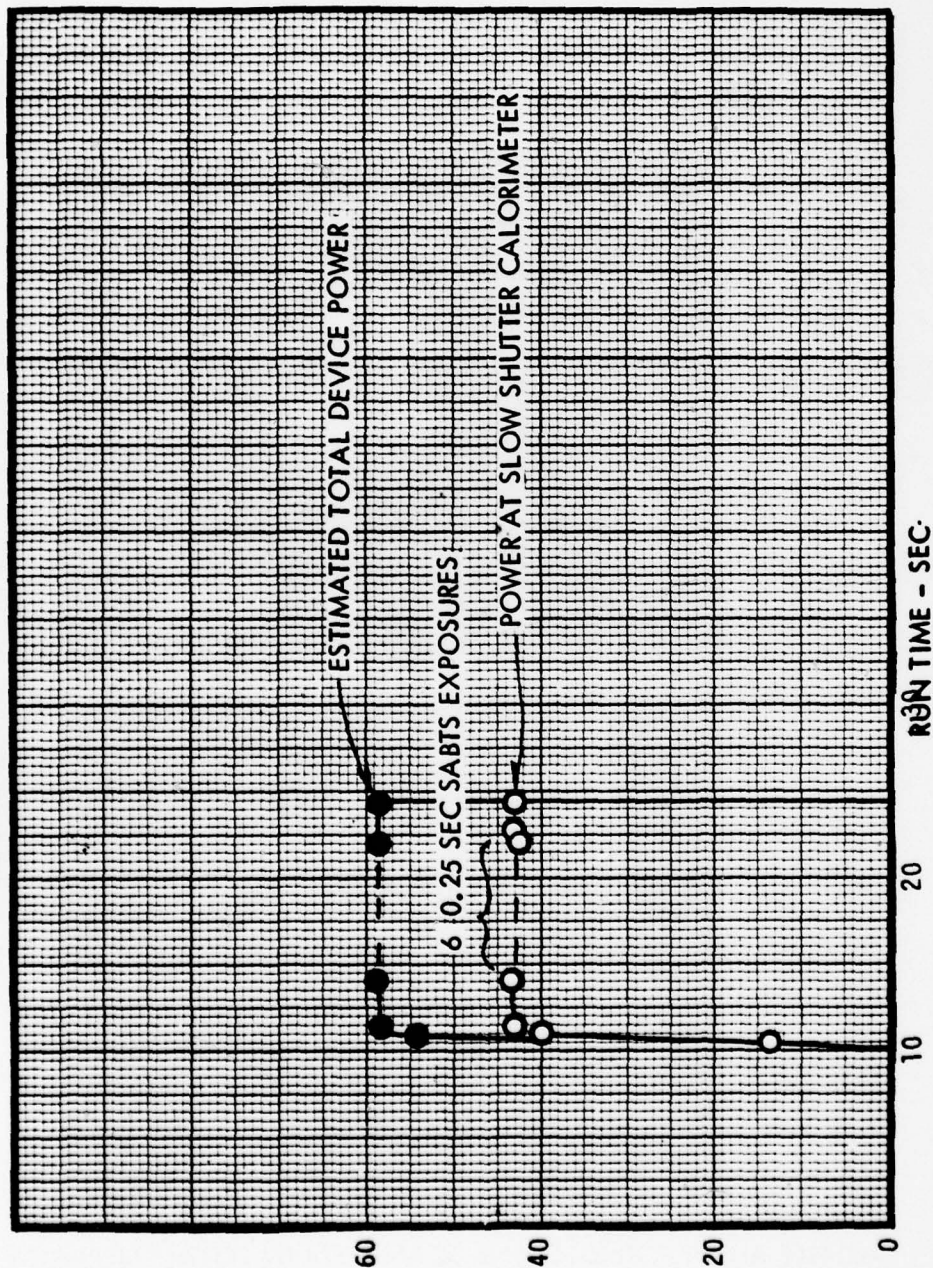
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-254

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGH

1-24-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET										
QUICK LOOK TEST DATA										
TEST PLAN	DATE	TIME	TOTAL COMPLETED TEST POSITIONS		PLANNED TOTAL PWR.					
VLI-254	1-22-77	2159	6		59					
D2 FIRE VALVE CLOSED (SEC)	24.3	LASING DURATION (SEC)	13.9							
PLANNED TEST NO. CE-1 TIME LINES AS OF DATE 1-21-77 REVISION A										
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		CONFIGURATION						
D MULLEN		1.5		<input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE						
PLANNED PEAK PWR DENSITY		8.2 KW/CM ²								
PLANNED			ACTUAL							
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER CM	COMMENTS
1	A1	HUGHES 3	.25	1.10	14.00	14.0	29.6	59	2.29	
2	A2	DOF 2	.25	1.10	15.35		27.6		↑	
3	A3	DOF 7	.25	1.10	16.70		26.8		↑	
4	A4	OCLI 4	.25	1.10	18.05		29.2		↑	
5	A5	OCLI 3	.25	1.10	19.40		19.6			
6	A6	PE 5	.25		20.75		28.0		2.29	
					21.00	23.7		59		
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		ON		O-GRAPH		MAN.	MAN.			
No. 2		ON		SANGAMO No. 1		6.0	28.0			
No. 3		ON		SANGAMO No. 2		NA				
No. 4		ON		SABTS SEQ.		14.0	21.0			
				CALORIMETER (SABTS)		14.0	21.0			
SABTS INST.				CALORIMETER (SLOW SHUTTER)		10.0	14.0			
HI FLOW SOLENOID		10.0	24.5	"		21.0	24.5			

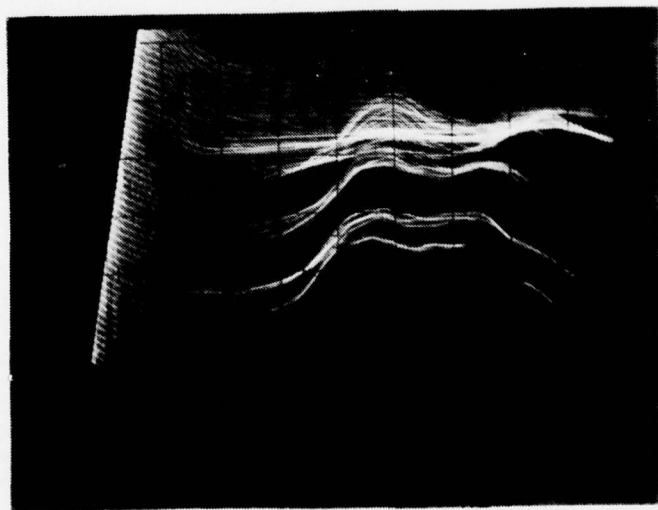
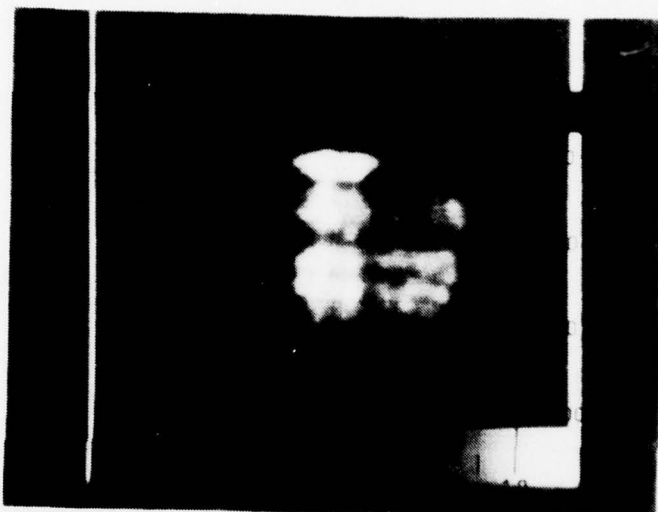
LASER PERFORMANCE ANALYSIS, RUN VLI-254

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY
APPROX. TIME (SEC) _____

LINEAR PROFILE*
APPROX. TIME (SEC) _____



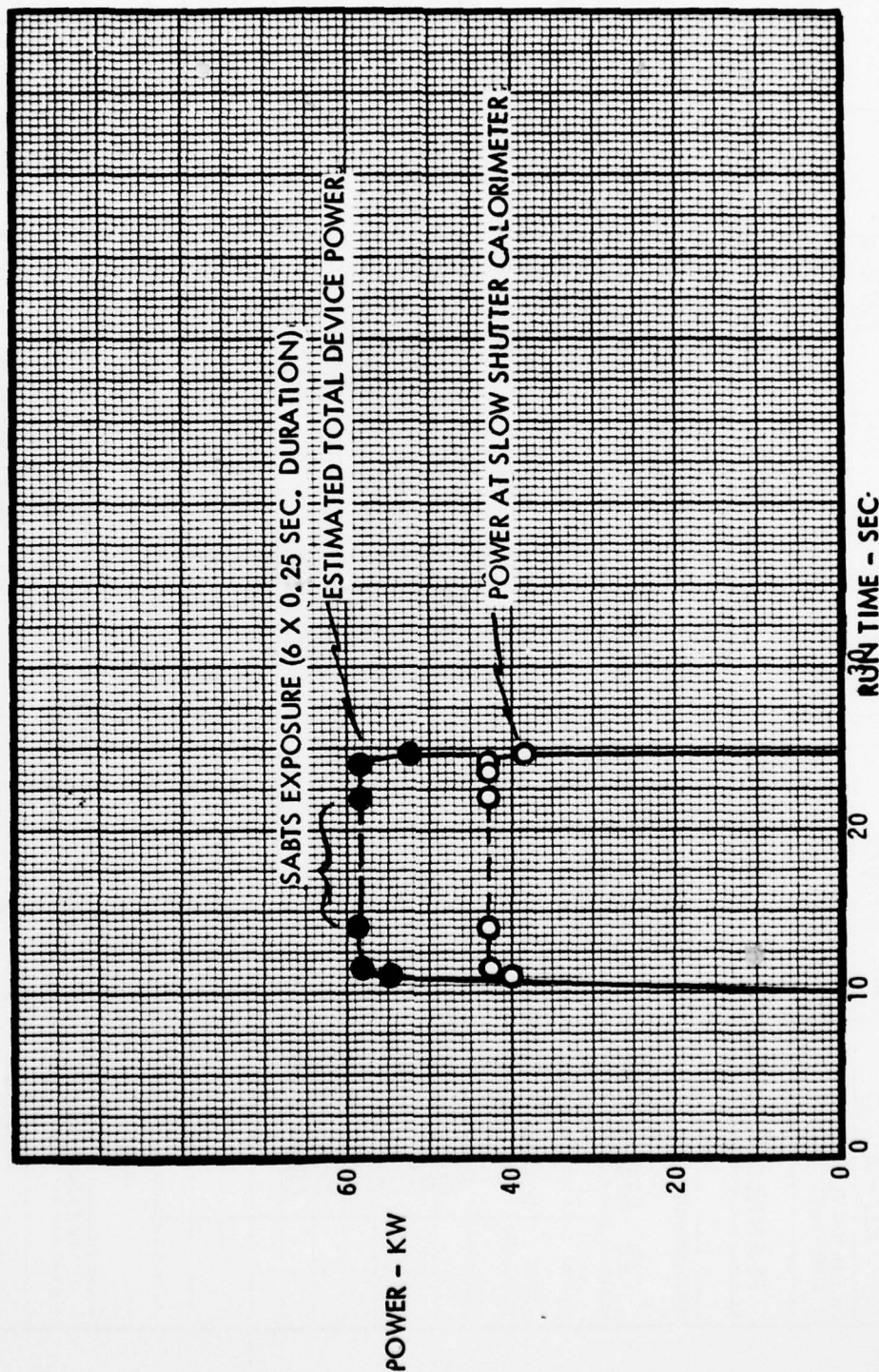
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-255

ESTIMATED POWER VS. TIME



REMARKS: _____

PREPARED BY: _____

J. S. 1-24-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME	PLANNED TEST NO.		TIME LINES		AS OF		
DATE		TIME		DATE		REVISION				
VLI-255	SARTS	1-24-77	1852	CE-2		AB				
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	LASING DURATION (SEC)	TOTAL COMPLETED TEST POSITIONS	PLANNED TOTAL PWR.						
10.4	24.1	13.7	6	59						
EXPERIMENTER D. MULLEN										
PLANNED LINEAR MAGNIFICATION 1.5		CONFIGURATION <input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE								
PLANNED PEAK PWR DENSITY 8.2 KW/CM²										
PLANNED				ACTUAL						
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER CM	COMMENTS
1	B1	HUGHES 1	.25	1.10	14.00	14.0	26.2	59	2.29	
2	B2	DOF 3	.25	1.10	15.35		23.2		1	
3	B3	DOF 6	.25	1.10	16.70		21.8			
4	B4	DCU 5	.25	1.10	18.05		30.0			
5	B5	DCU 2	.25	1.10	19.40		18.3			
6	B6	PE 8	.25		20.75		20.5		2.29	
					21.00			59		
						23.6				
ITEM										
TV CAMERA No. 1		ON		STOP (SEC)		ITEM		START (SEC)		STOP (SEC)
No. 2		"				O-GRAPH		MAN.		MAN.
No. 3		"				SANGAMO No. 1		6.0		28.0
No. 4		"				SANGAMO No. 2		NA		
		"				SARTS SEQ.		14.0		21.0
		"				CALORIMETER (SARTS)		14.0		21.0
SARTS INST.						CALORIMETER (SLOW SHUTTER)		10.0		14.0
HI FLOW SOLENOID		10.0		24.5		1'		21.0		24.5

LASER PERFORMANCE ANALYSIS, RUN VLI-255

BEAM INTENSITY PROFILE

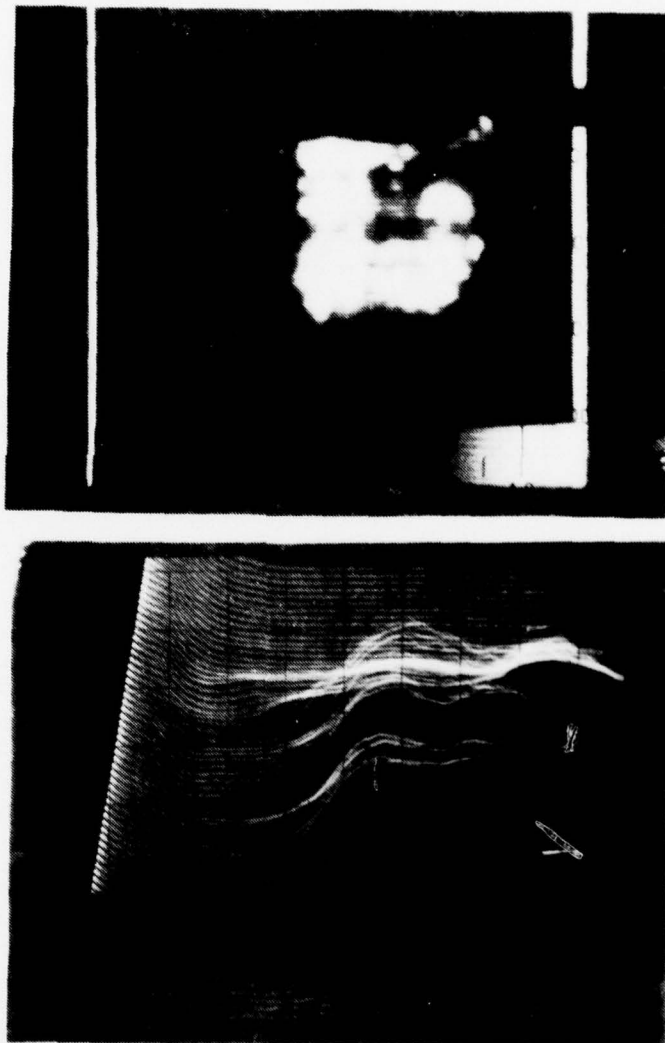
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) _____

LINEAR PROFILE*

APPROX. TIME (SEC) _____



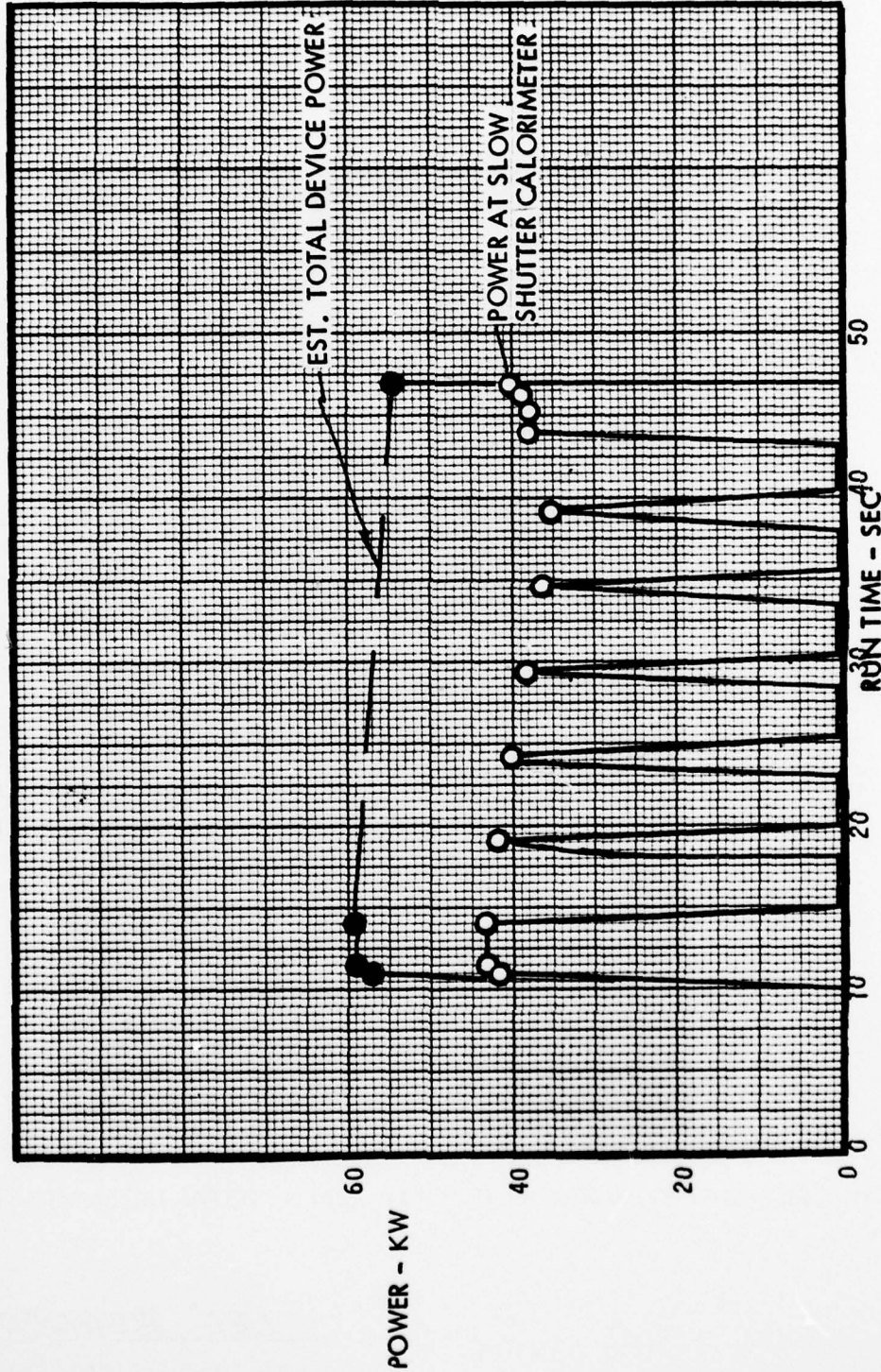
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL1-256

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGS

1-25-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA																																																																
RUN NO.	TEST PLAN	DATE	TIME	PLANNED TEST NO. CF-9		TIME LINES		AS OF DATE / - / -77 REVISION																																																								
VLI-256	SABTS	1-24-77	2134	PLANNED TEST NO. CF-9		TIME LINES		AS OF DATE / - / -77 REVISION																																																								
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	LASING DURATION (SEC)	TOTAL COMPLETED TEST POSITIONS	PLANNED TOTAL PWR.		PLANNED TOTAL PWR.		PLANNED TOTAL PWR.																																																								
9.9	46.8	36.9	6	59		59		59																																																								
<table border="1"> <thead> <tr> <th colspan="2">EXPERIMENTER</th> <th>PLANNED LINEAR MAGNIFICATION</th> <th>1.5</th> <th>CONFIGURATION</th> <th>REFLECTIVE</th> <th>TRANSMISSIVE</th> </tr> </thead> <tbody> <tr> <td colspan="2">D. MULLEN</td> <td>PLANNED PEAK PWR DENSITY</td> <td>8.2 MW/CM²</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										EXPERIMENTER		PLANNED LINEAR MAGNIFICATION	1.5	CONFIGURATION	REFLECTIVE	TRANSMISSIVE	D. MULLEN		PLANNED PEAK PWR DENSITY	8.2 MW/CM ²																																												
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION	1.5	CONFIGURATION	REFLECTIVE	TRANSMISSIVE																																																										
D. MULLEN		PLANNED PEAK PWR DENSITY	8.2 MW/CM ²																																																													
PLANNED				ACTUAL																																																												
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS																																																						
1	C1	HUGHES	4.0	1.10	14.00	17.6	25.8	59	2.29																																																							
2	C2	DOF 1	4.0	1.10	19.10				↑																																																							
3	C3	DOF 8	4.0	1.10	24.20	22.7	24.9		↓																																																							
4	C4	OCL 6	4.0	1.10	29.30																																																											
5	C5	OCL 1	4.0	1.10	34.40																																																											
6	C6	P-E 7	4.0		39.50	38.1	21.8	59	2.29																																																							
					43.50	42.1																																																										
						46.0		54																																																								
<table border="1"> <thead> <tr> <th>ITEM</th> <th>START (SEC)</th> <th>STOP (SEC)</th> <th>ITEM</th> <th>START (SEC)</th> <th>STOP (SEC)</th> </tr> </thead> <tbody> <tr> <td>TV CAMERA No. 1</td> <td>ON</td> <td></td> <td>O-GRAPH</td> <td>MAN.</td> <td>NAN.</td> </tr> <tr> <td>No. 2</td> <td>ON</td> <td></td> <td>SANGAMO No. 1</td> <td>6.0</td> <td>49.0</td> </tr> <tr> <td>No. 3</td> <td>ON</td> <td></td> <td>SANGAMO No. 2</td> <td>N/A</td> <td></td> </tr> <tr> <td>No. 4</td> <td>ON</td> <td></td> <td>SABTS SEQ.</td> <td>14.0</td> <td>43.5</td> </tr> <tr> <td></td> <td></td> <td></td> <td>CALORIMETER (SABTS)</td> <td>14.0</td> <td>43.5</td> </tr> <tr> <td></td> <td></td> <td></td> <td>CALORIMETER (SLOW SHUTTER)</td> <td>10.0</td> <td>14.0</td> </tr> <tr> <td>SABTS INST.</td> <td></td> <td></td> <td>" "</td> <td>43.5</td> <td>47.0</td> </tr> <tr> <td>HI FLOW SOLENOID</td> <td>10.0</td> <td>47.0</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>											ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)	TV CAMERA No. 1	ON		O-GRAPH	MAN.	NAN.	No. 2	ON		SANGAMO No. 1	6.0	49.0	No. 3	ON		SANGAMO No. 2	N/A		No. 4	ON		SABTS SEQ.	14.0	43.5				CALORIMETER (SABTS)	14.0	43.5				CALORIMETER (SLOW SHUTTER)	10.0	14.0	SABTS INST.			" "	43.5	47.0	HI FLOW SOLENOID	10.0	47.0			
ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)																																																											
TV CAMERA No. 1	ON		O-GRAPH	MAN.	NAN.																																																											
No. 2	ON		SANGAMO No. 1	6.0	49.0																																																											
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No. 4	ON		SABTS SEQ.	14.0	43.5																																																											
			CALORIMETER (SABTS)	14.0	43.5																																																											
			CALORIMETER (SLOW SHUTTER)	10.0	14.0																																																											
SABTS INST.			" "	43.5	47.0																																																											
HI FLOW SOLENOID	10.0	47.0																																																														

LASER PERFORMANCE ANALYSIS, RUN VL1-256

BEAM INTENSITY PROFILE

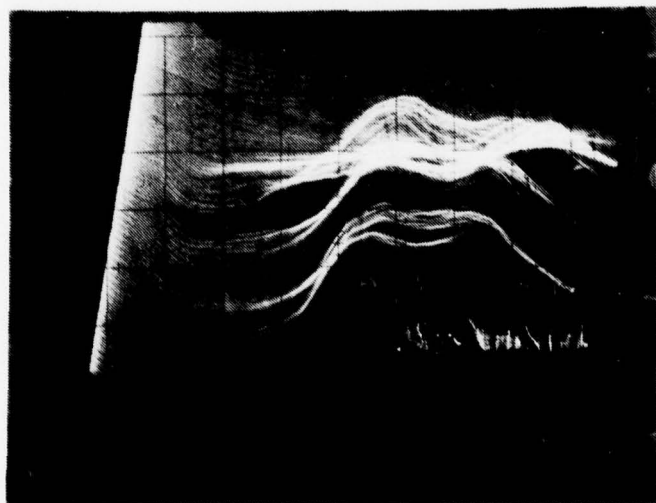
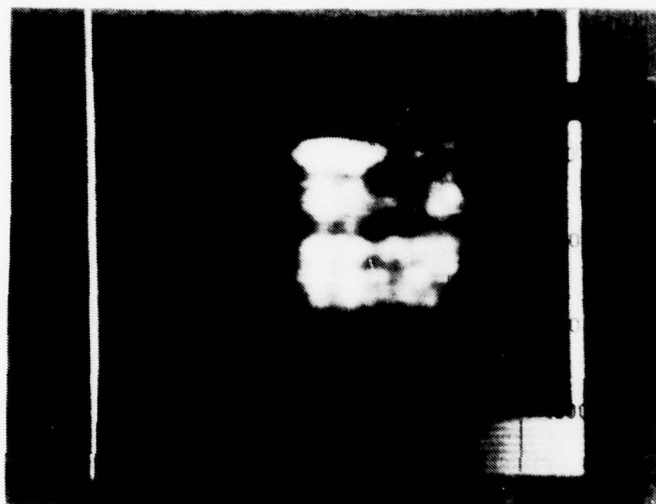
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) 20



*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL

SABTS

TEST SERIES

SHOT NUMBER

DATE (MO/DAY/YR) 1-26-77

1-257

D₂ FIRE VALVE OPEN (SEC)

10.4

D₂ FIRE VALVE CLOSED (SEC)

24.2

LASING DURATION (SEC)

13.80

PERFORMANCE PARAMETERS AT SELECTED TIME SLICES

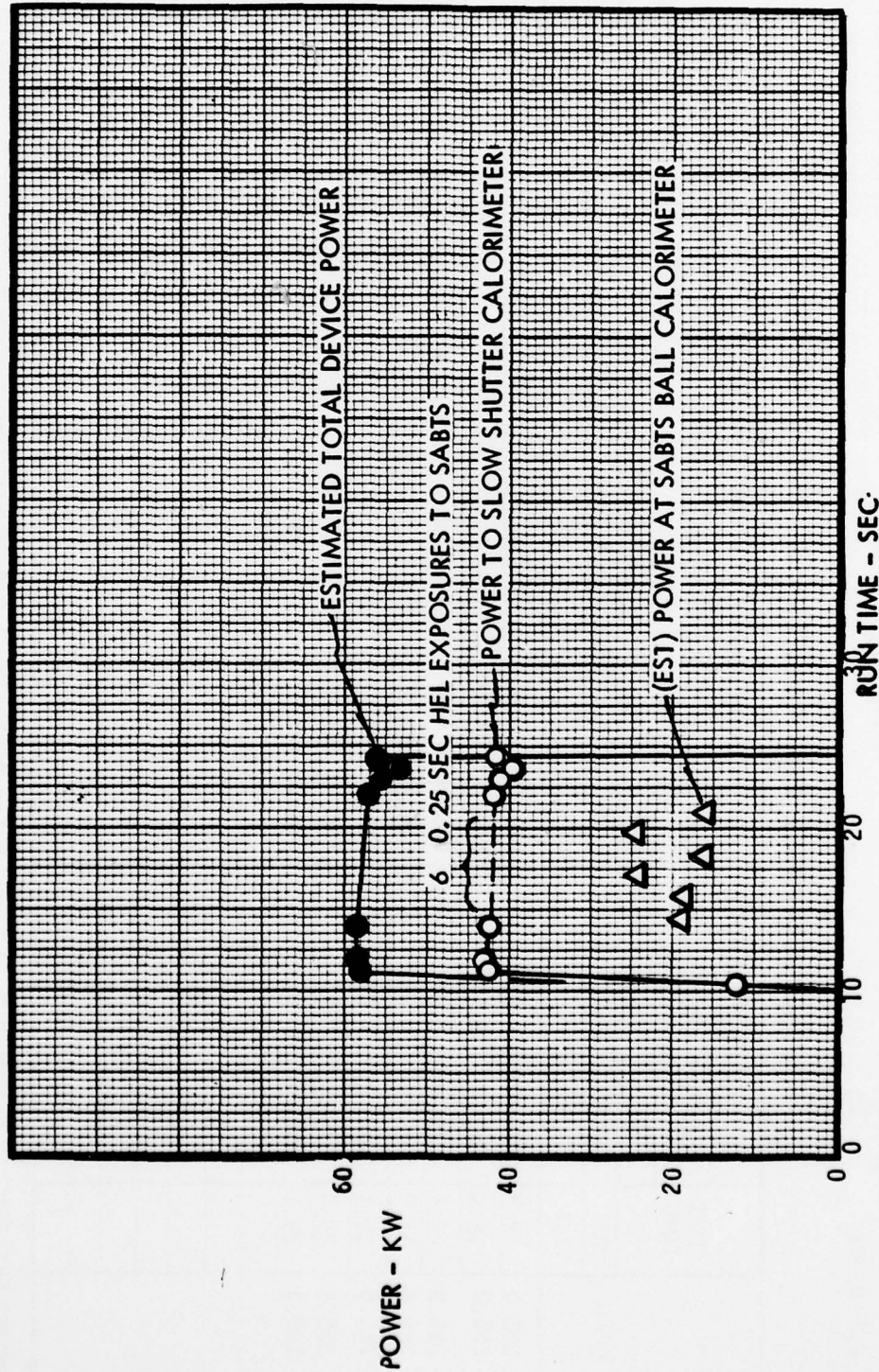
[illegible]

NOTES AND DR'S: SLIGHT DIP IN POWER @ END OF TEST (1) 6 0.25 SEC
HEL EXPOSURES TO SABTS. Tc1P = 71°F *EF2RC 212 @ one PT 19 + SEC.

PREPARED BY: J. Sings
1-26-77

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-257

ESTIMATED POWER VS. TIME



REMARKS: _____

PREPARED BY: _____

J. SING

1-27-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME							
VLI-257	SABTS	1-26-77	1715							
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	24.2	LASING DURATION (SEC)	13.80	TOTAL COMPLETED TEST POSITIONS	6	PLANNED TOTAL PWR.	59		
PLANNED TEST NO. CE-4 TIME LINES AS OF DATE 1-24-77 REVISION ORIG										
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		2.2		CONFIGURATION				
D. MULLEN		PLANNED PEAK PWR DENSITY		17.6 KW/CM ²		<input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE				
PLANNED						ACTUAL				
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	B1	HUGHES	.25	1.10	14.00	14.4	19.2	58.5	1.6	
2	B2	DOF	.25	1.10	15.35		20.4		↑	
3	B3	DOF	.25	1.10	16.70		22.4		↓	
4	B4	OCLI	.25	1.10	18.05		16.4			
5	B5	OCLI	.25	1.10	19.40		24.4			
6	B6	P-E	.25		20.75		16.0		1.6	
					21.00	23.1		56.2		
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		ON		O-GRAPH		MAN	MAN.			
No. 2		"		SANGAMO No. 1		6.0	28.0			
No. 3		"		SANGAMO No. 2		N/A				
No. 4		"		SABTS SEQ.		14.0	21.0			
				CALORIMETER (SABTS)		14.0	21.0			
SABTS INST.				CALORIMETER (SLOW SHUTTER)		10.0	14.0			
HI FLOW SOLENOID		10.0	24.5	"		21.0	24.5			

LASER PERFORMANCE ANALYSIS, RUN VLI-257

BEAM INTENSITY PROFILE

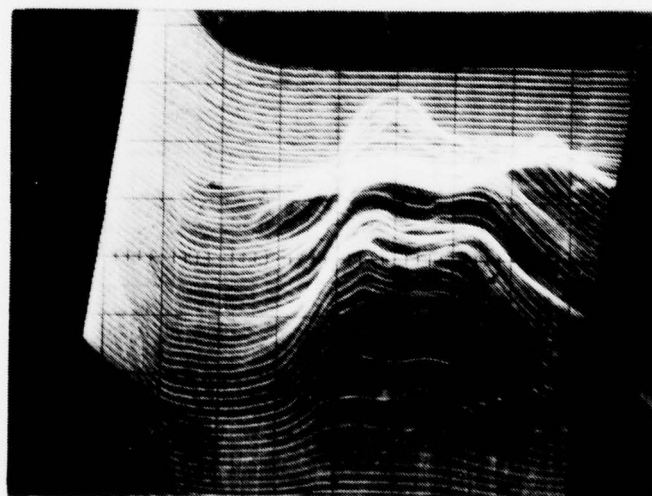
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) 20



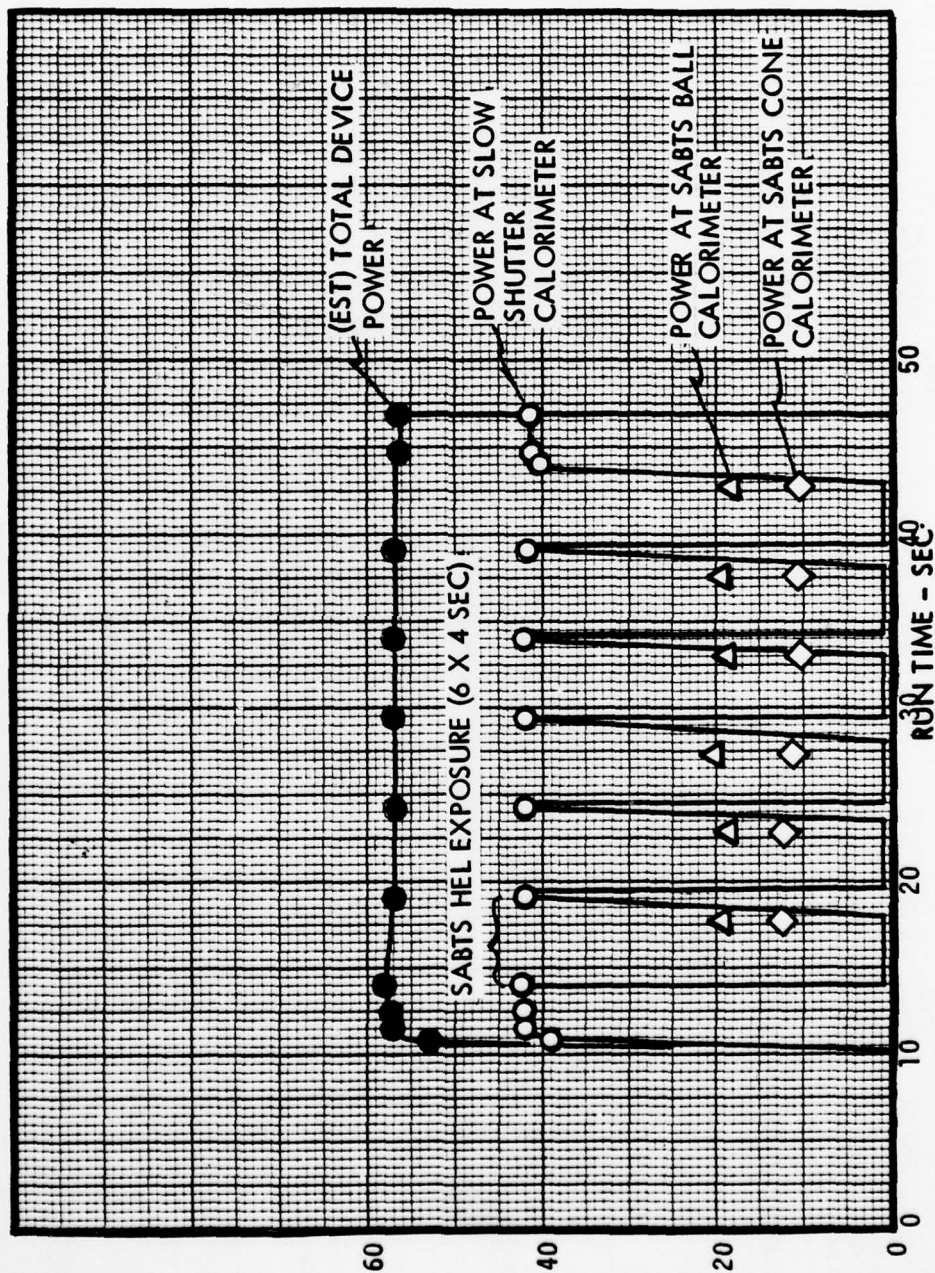
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-258

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGH
1-27-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA

RUN NO. VLI-258	TEST PLAN SABTS	DATE 1-26-77	TIME 1840
D2 FIRE VALVE OPEN (SEC) 10.4	D2 FIRE VALVE CLOSED (SEC) 46.8	LASING DURATION (SEC) 36.4	TOTAL COMPLETED TEST POSITIONS 6
			PLANNED TOTAL PWR. 59

PLANNED TEST NO. **CE-10** TIME LINES AS OF DATE **1-24-77** REVISION **ORIG**

EXPERIMENTER D. MULLEN	PLANNED LINEAR MAGNIFICATION 2.2	CONFIGURATION <input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE
	PLANNED PEAK PWR DENSITY 17.6 KW/CM²	

		PLANNED			ACTUAL					
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	C1	HUGHES	4.0	1.10	14.00	14.4	19.5	58	1.6	
2	C2	DOF	4.0	1.10	19.10		18.8		↑	
3	C3	DOF	4.0	1.10	24.20		20.5			
4	C4	OCU	4.0	1.10	29.30		18.8		↓	
5	C5	OCU	4.0	1.10	34.40		19.5			
6	C6	P-E	4.0		39.50		18.3		1.6	
					43.50	46.3		56.5		

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPI	MAN.	MAN.
No. 2			SANGAMO No. 1	6.0	49.0
No. 3			SANGAMO No. 2	N/A	43.5
No. 4			SABTS SEQ.	14.0	43.5
SABTS IIIST.			CALORIMETER (SABTS)	14.0	14.0
HI FLOW SOLENOID	10.0	47.0	CALORIMETER (SLOW SHUTTER)	10.0	47.0

REF: TCR ML 21363 PAGE **3** OF **4**

AD-A068 495

TRW INC REDONDO BEACH CALIF

F/G 21/5

SHARED APERTURE BREADBOARD TEST SYSTEM (SABTS) LASER SUPPORT.(U)

DEC 78 T V ROSZHART, W P BALL, J T SINGS

F29601-77-C-0010

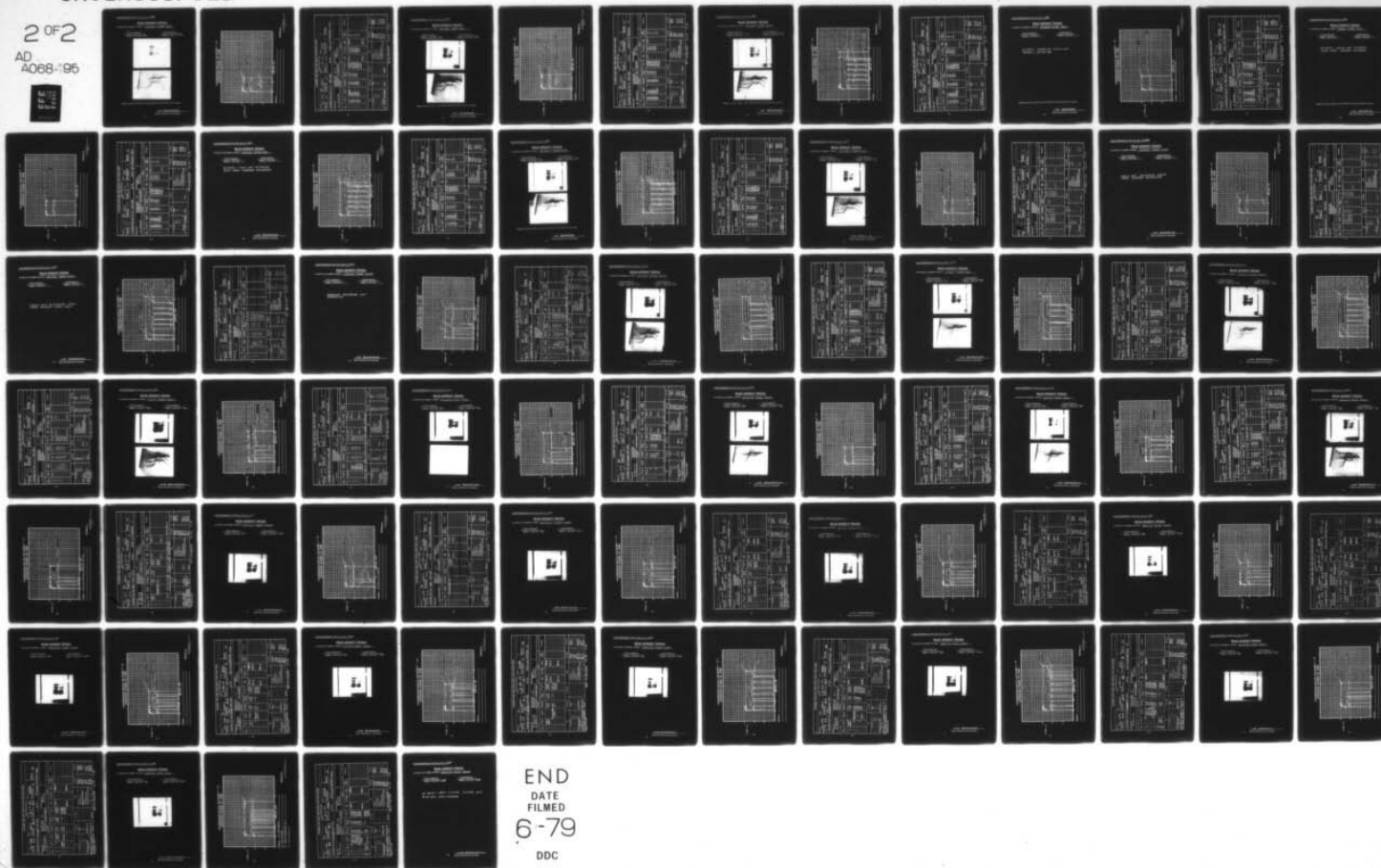
UNCLASSIFIED

AFWL-TR-77-135

NL

2 OF 2

AD
A068-96



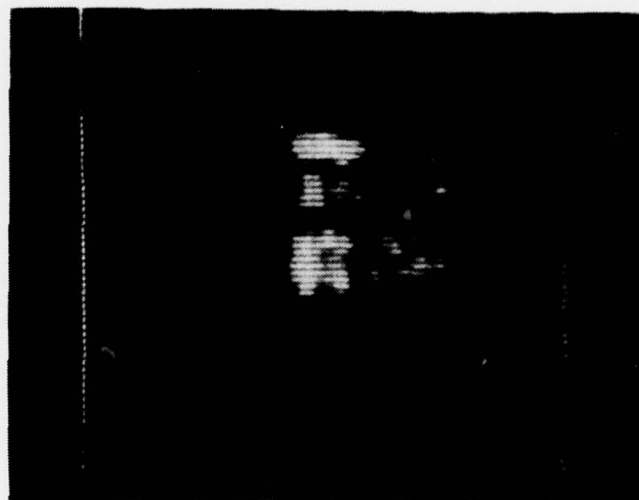
END
DATE
FILMED
6-79
DDC

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

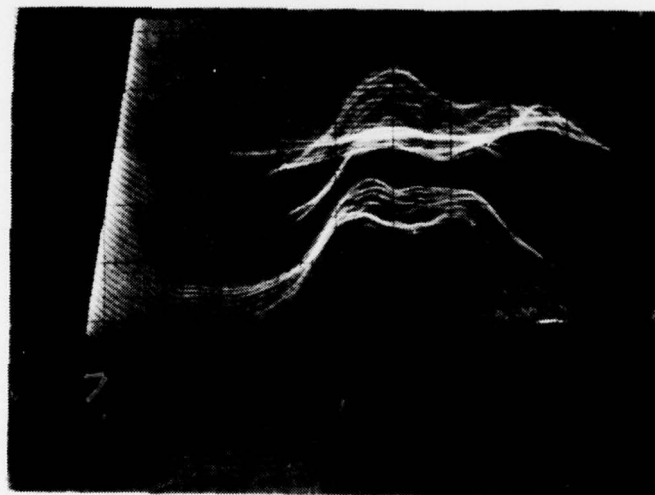
TOTAL INTENSITY

APPROX. TIME (SEC) 20



LINEAR PROFILE*

APPROX. TIME (SEC) 20



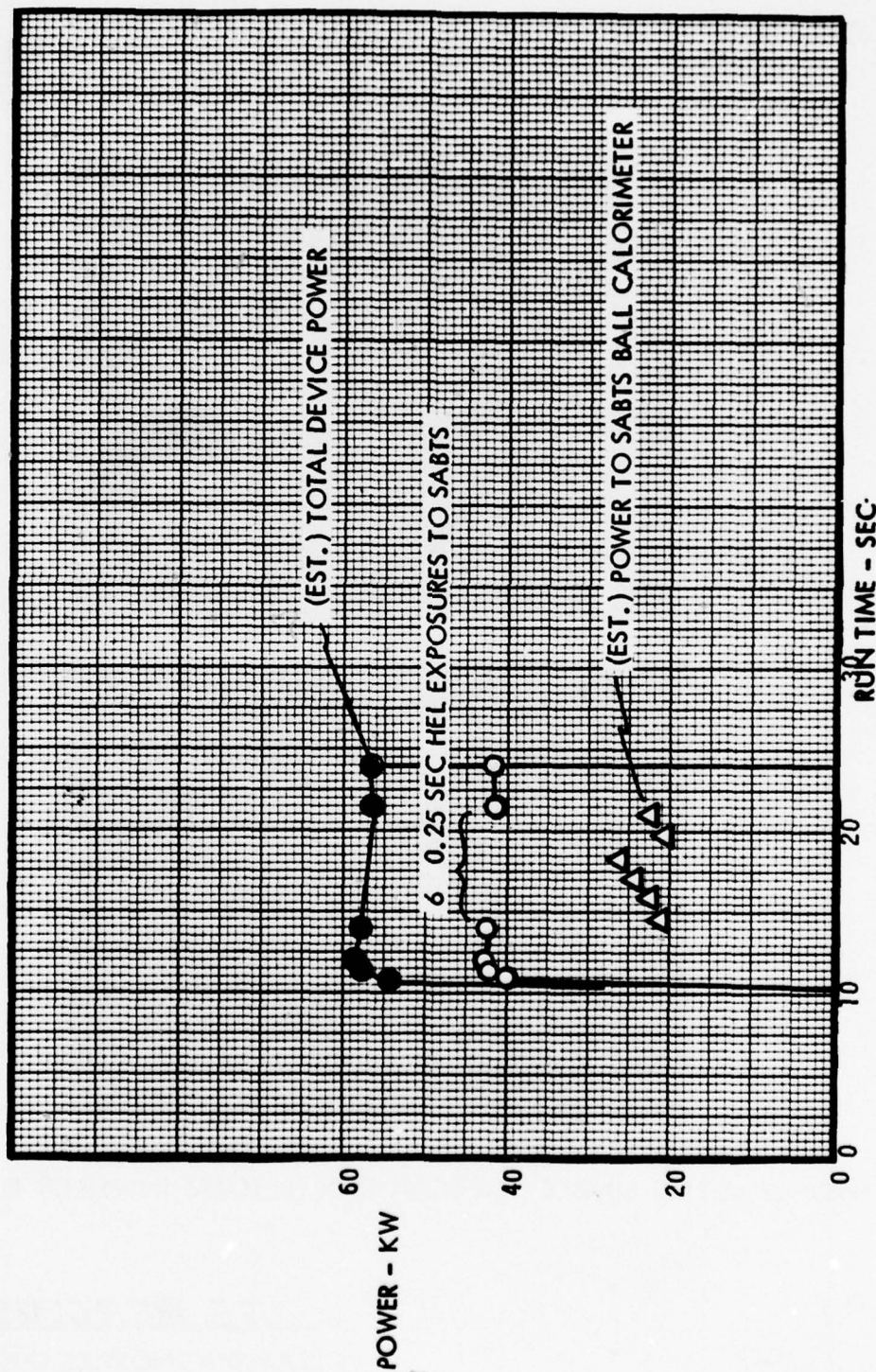
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-259

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. Sines

1-27-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA	
REF NO. VLI-259	TEST PLAN SABTS
DATE 1-27-77	TIME 2039
D2 FIRE VALVE OPEN (SEC) 10.4	D2 FIRE VALVE CLOSED (SEC) 24.2
LASING DURATION (SEC) 13.8	TOTAL COMPLETED TEST POSITIONS 6
PLANNED TOTAL PWR.	
PLANNED TEST NO. CE-3 TIME LINES AS OF DATE 1-24-77 REVISION ORIG	

EXPERIMENTER	PLANNED LINEAR MAGNIFICATION 2.2	CONFIGURATION <input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE
D. MULLEN	PLANNED PEAK PWR DENSITY 17.6 KW/CM²	

TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	A1	HUGHES	.25	1.10	14.00	14.4	21.2	58.5	1.6	
2	A2	DOF	.25	1.10	15.35		22.4		↑	
3	A3	DOF	.25	1.10	16.70		24.4		↑	
4	A4	OCLI	.25	1.10	18.05		26.4		↓	
5	A5	OCLI	.25	1.10	19.40		20.4		↓	
6	A6	P-E	.25		20.75		22.4		1.6	
					21.00	23.6		56.5		

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH	MAN. 6.0	MAN. 28.0
No. 2	"		SANGAMO No. 1	N/A	
No. 3	"		SANGAMO No. 2	14.0	21.0
No. 4	"		SABTS SEQ.	14.0	21.0
			CALORIMETER (SABTS)	10.0	14.0
SABTS INST.			CALORIMETER (SLOW SHUTTER)	21.0	24.5
HI FLOW SILENDIOD	10.0	24.5	" " "		

LASER PERFORMANCE ANALYSIS, RUN VL1-259

BEAM INTENSITY PROFILE

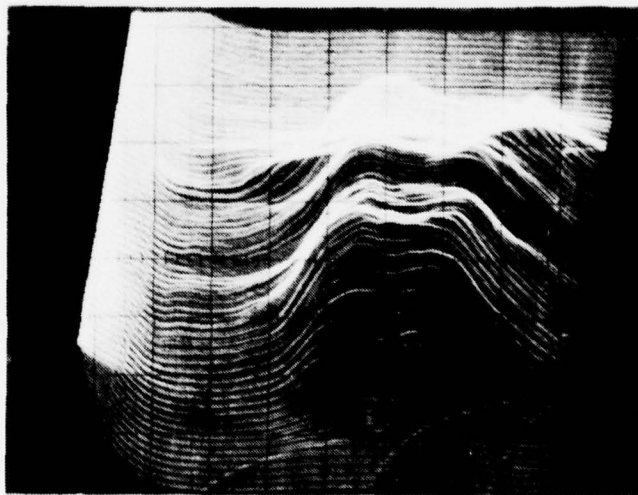
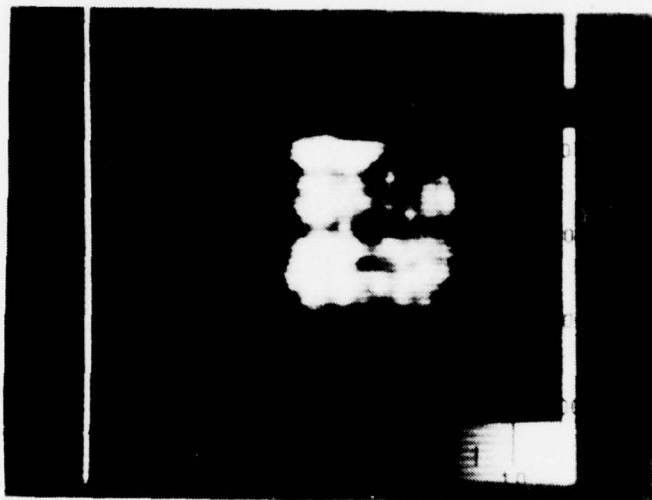
AS SEEN BY IR CAMERA VIEWING SECOND TURIN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) 20



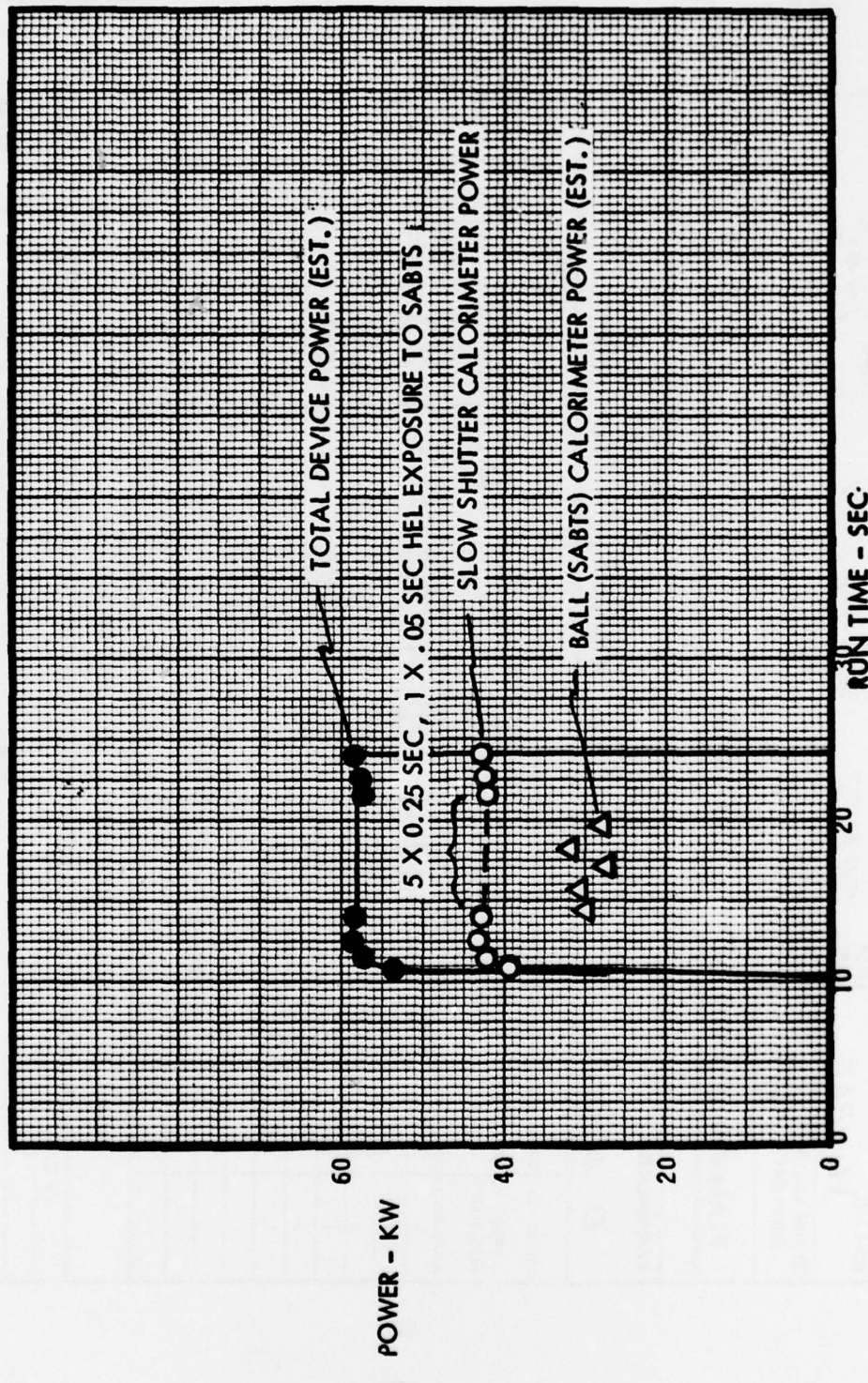
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-260

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGG

1-28-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA									
RUN NO.	TEST PLAN	DATE	TIME						
VLI-260	SABTS	1-27-77	1945						
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	LASING DURATION (SEC)	TOTAL COMPLETED TEST POSITIONS	PLANNED TOTAL PWR. 57					
10.4	24.2	13.8	6						
PLANNED TEST NO. CE-6				TIME LINES		AS OF		DATE 1-27-77 REVISION A	

EXPERIMENTER		PLANNED LINEAR MAGNIFICATION	2.7	CONFIGURATION	REFLECTIVE		TRANSMISSIVE	
D. MULLEN		PLANNED PEAK PWR DENSITY	28 KW/CM ²		<input checked="" type="checkbox"/>		<input type="checkbox"/>	

PLANNED						ACTUAL				COMMENTS
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	
1	B1	PE	.25	1.10	14.00	14.4	30.0	58.0	1.3	
2	B2	DOF	.25	1.10	15.35		30.4			
3	B3	DOF	.25	1.10	16.70		27.2			
4	B4	OCU	.25	1.10	18.05		32.0			
5	B5	OCU	.25	1.10	19.40		28.0			
6	B6	PLEXI	.05		20.75				1.3	
					20.80					

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH	MAN	MAN.
No. 2	"		SANGAMO No. 1	6.0	28.0
No. 3	"		SANGAMO No. 2	N/A	
No. 4	"		SABTS SEQ.	14.0	21.0
			CALORIMETER (SABTS)	14.0	21.0
			CALORIMETER (SLOW SHUTTER)	10.0	14.0
SABTS INST.			"	"	24.5
HI FLOW SOLENOID	10.0	24.5		20.8	24.5

LASER PERFORMANCE ANALYSIS, RUN VL1-260

BEAM INTENSITY PROFILE

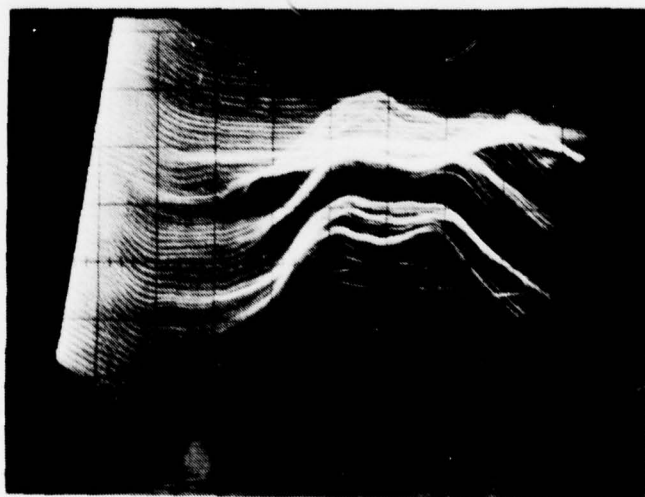
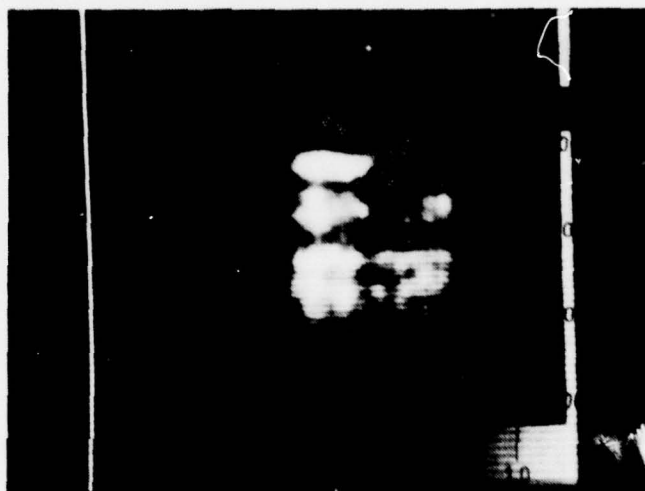
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) 20

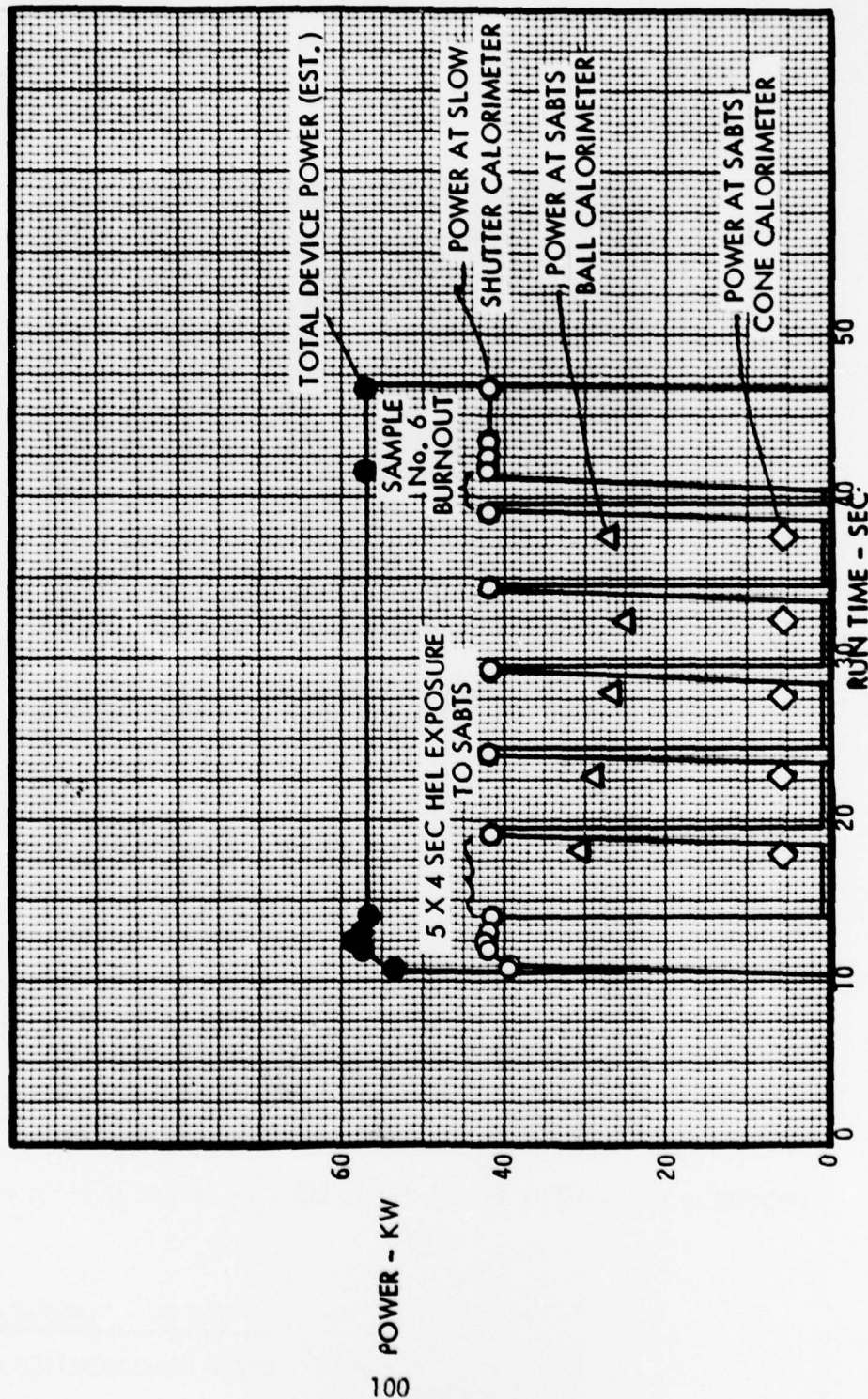


*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

L. Swags

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA									
RUN NO.	TEST PLAN	DATE	TIME	PLANNED TOTAL PWR.					
VII-261	SABTS	1-28-77	2056	59					
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	46.7	LASING DURATION (SEC)	36.3	TOTAL COMPLETED TEST POSITIONS				
6									
PLANNED TEST NO. CE-11 TIME LINES AS OF DATE 1-26-77 REVISION ORIG									

EXPERIMENTER		PLANNED LINEAR MAGNIFICATION	2.7	CONFIGURATION	REFLECTIVE	TRANSMISSIVE
D. MULLEN		PLANNED PEAK PWR DENSITY	28 KW/CM ²			

PLANNED						ACTUAL			COMMENTS	
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER		ACTUAL SPOT DIAMETER
1	C1	PE	4.0	1.10	14.00	18.0	30.7	58	1.3	
2	C2	DNF	4.0	1.10	19.10		28.8		↑	
3	C3	DNF	4.0	1.10	24.20		26.7		↑	
4	C4	OCL1	4.0	1.10	29.30		24.9		↑	
5	C5	OCL1	4.0	1.10	34.40		27.0		1.3	
6	C6	HUGHES	4.0		39.50					
					43.50			57.6		

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH	MAN	MAN.
No. 2	"		SANGAMO No. 1	6.0	49.0
No. 3	"		SANGAMO No. 2	N/A	
No. 4	"		SABTS SEQ.	14.0	43.5
			CALORIMETER (SABTS)	14.0	43.5
			CALORIMETER (SLOW SHUTTER)	10.0	14.0
SABTS INST.				43.5	47.0
HI FLOW SOLAROID	10.0	47.0			

LASER PERFORMANCE ANALYSIS, RUN VLI-261.

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) _____

LINEAR PROFILE*

APPROX. TIME (SEC) _____

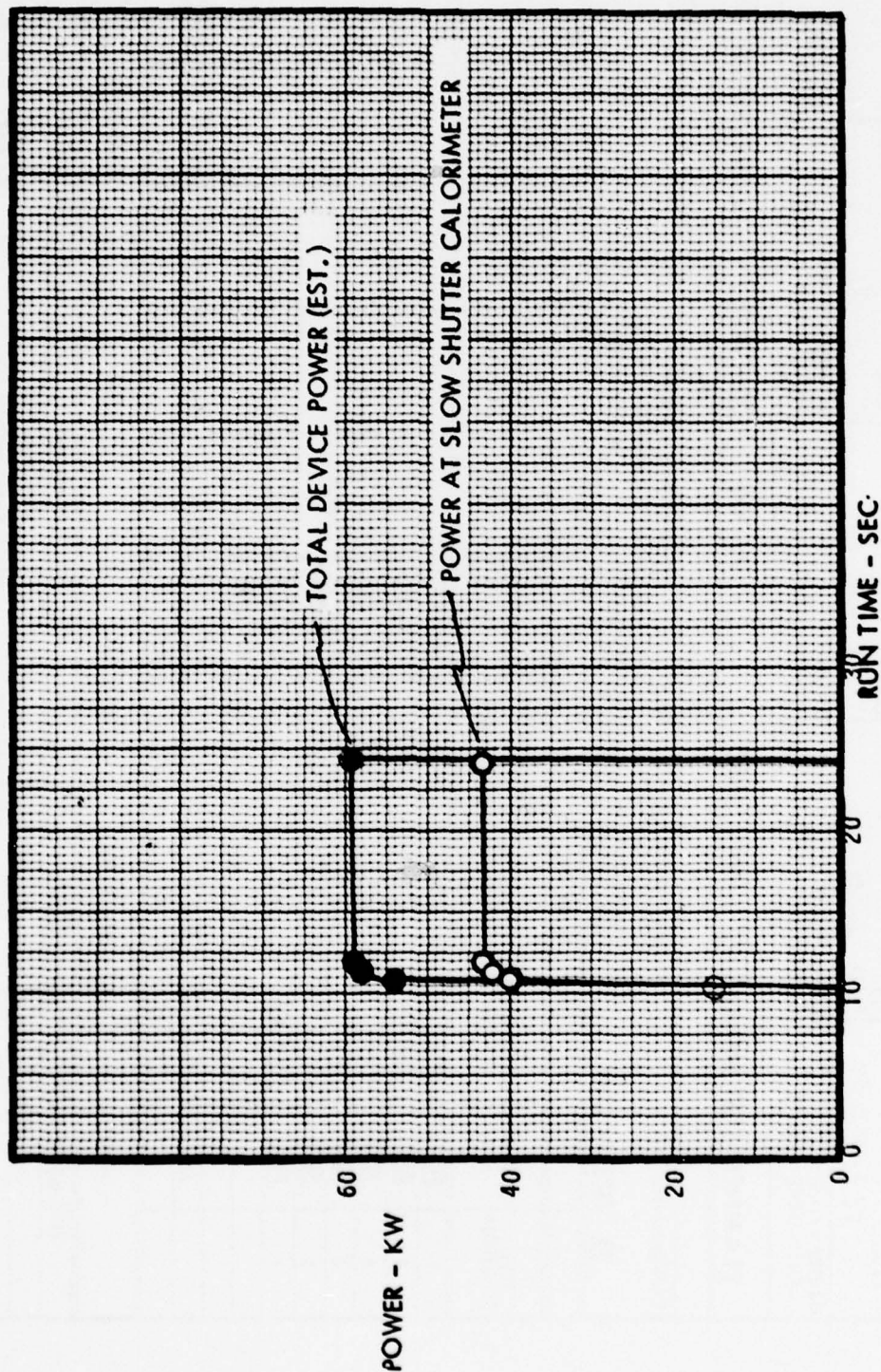
*NO DATA - OPERATING SWITCH NOT
TURNED ON AFTER EM.*

*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-262
ESTIMATED POWER VS. TIME



REMARKS: NO HEL DELIVERED TO SABTS TEST AREA

PREPARED BY:

L. Smith
 1-28-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME							
VLI-262	SABTS	1-28-77	1731							
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	24.3	LASING DURATION (SEC)	13.9	TOTAL COMPLETED TEST POSITIONS	0	PLANNED TOTAL PWR.	59		
PLANNED TEST NO. CE-8 TIME LINES AS OF DATE 1-28-77 REVISION 0R16										
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		3.5		CONFIGURATION				
D. MULLEN		PLANNED PEAK PWR DENSITY		38 KW/CM ²		<input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE				
PLANNED						ACTUAL				
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	B1	PE	.25	1.10	14.00			59.2		
2	B2	DOF	.25	1.10	15.35					
3	B3	DOF	.25	1.10	16.70					
4	B4	OCL	.25	1.10	18.05					
5	B5	OCL	.25	1.10	19.40					
6	B6	PLEXI	.11		20.75			59.6		
						NOTE: SLOW SHUTTER DID NOT OPEN - G _{N2} PRESSURE NOT LOADED TO SABTS ACCUMULATOR.				
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		DN		O-GRAPH		NAN.	MAN.			
No. 2		"		SANGAMO No. 1		6.0	28.0			
No. 3		"		SANGAMO No. 2		N/A				
No. 4		"		SABTS SEQ.		14.0	20.86			
				CALORIMETER (SABTS)		14.0	20.86			
SABTS INST.				CALORIMETER (SLOW SHUTTER)		10.0	14.0			
HI FLOW SOLENOID		10.0	24.5	" " "		20.86	24.5			

LASER PERFORMANCE ANALYSIS, RUN VLI-262

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) _____

LINEAR PROFILE*

APPROX. TIME (SEC) _____

*NO DATA - COULD NOT RETRIEVE
DATA FROM SANGAMO RECORDER*

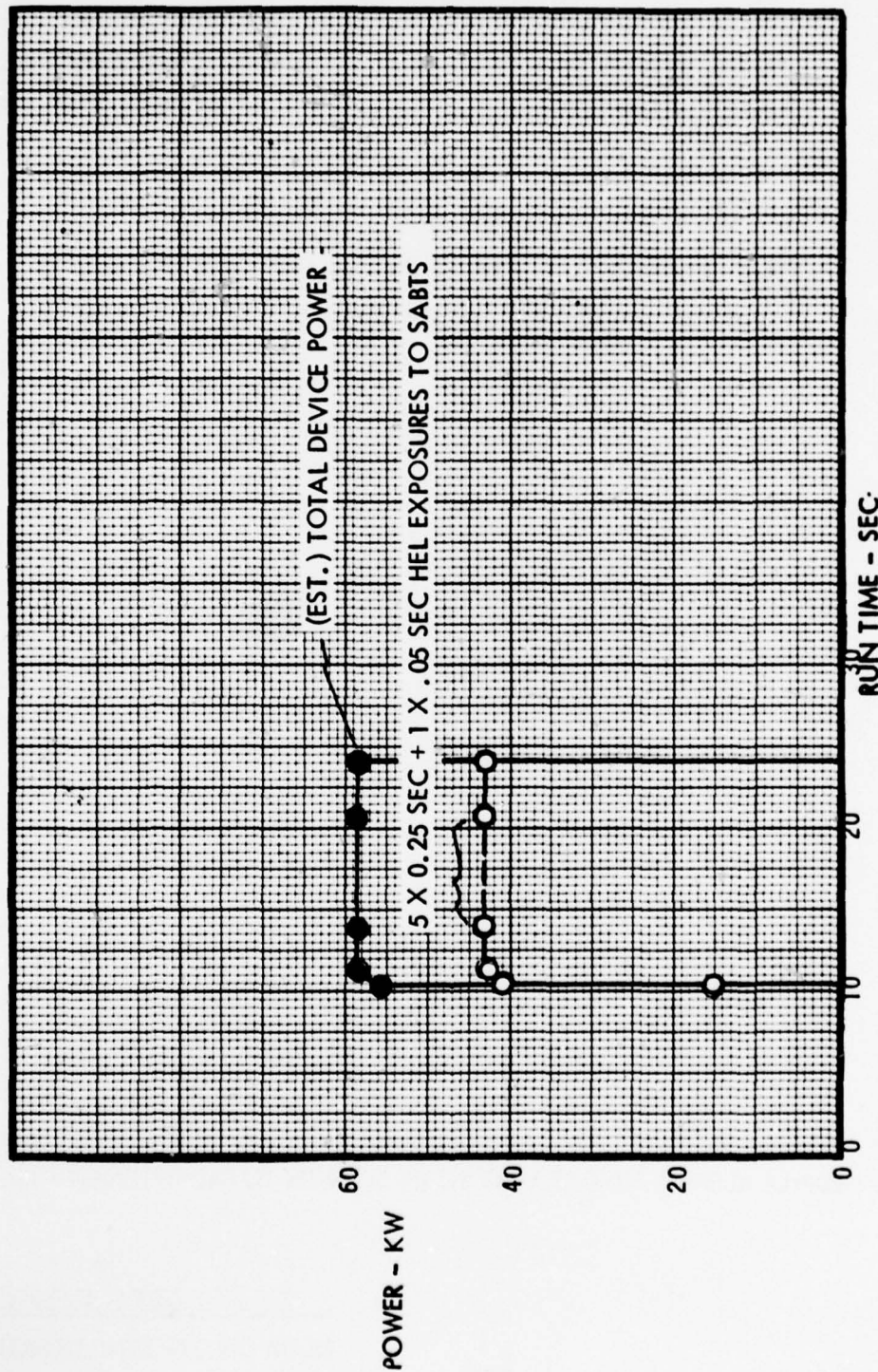
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-263

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGH
1-28-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET										
RUN NO. VLI-263		TEST PLAN SABTS	DATE 1-28-77	TIME 1839						
D2 FIRE VALVE OPEN (SEC) 10.4		D2 FIRE VALVE CLOSED (SEC) 24.2	LASING DURATION (SEC) 13.8	TOTAL COMPLETED TEST POSITIONS 6	PLANNED TOTAL PWR. 59					
PLANNED TEST NO. CE-8 TIME LINES					AS OF DATE 1-28-77 REVISION ORIG					
EXPERIMENTER D. MULLEN		PLANNED LINEAR MAGNIFICATION 3.5	CONFIGURATION <input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE							
		PLANNED PEAK PWR DENSITY 38 KW/CM²								
PLANNED			ACTUAL							
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	B1	PE	.25	1.10	14.00	14.4	25.2	59.4	1.0	
2	B2	D0F	.25	1.10	15.35		27.6		↑	
3	B3	D0F	.25	1.10	16.70		25.2		↑	
4	B4	OCLL	.25	1.10	18.05		24.4		↓	
5	B5	OCLL	.25	1.10	19.40		26.4		1.0	
6	B6	PLEXI	.11		20.75			59.2		
					20.86					
ITEM			START (SEC)	STOP (SEC)	ITEM			START (SEC)	STOP (SEC)	
TV CAMERA No. 1			DN		O-GRAPH			NAN.	NAN.	
No. 2			"		SANGAMO No. 1			6.0	28.0	
No. 3			"		SANGAMO No. 2			N/A		
No. 4			"		SABTS SEQ.			14.0	20.86	
					CALORIMETER (SABTS)			14.0	20.86	
SABTS INST.					CALORIMETER (SLOW SHUTTER)			10.0	14.0	
HI FLOW SOLENOID			10.0	24.5	" " "			20.86	24.5	

LASER PERFORMANCE ANALYSIS, RUN VLI-263

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) _____

LINEAR PROFILE*

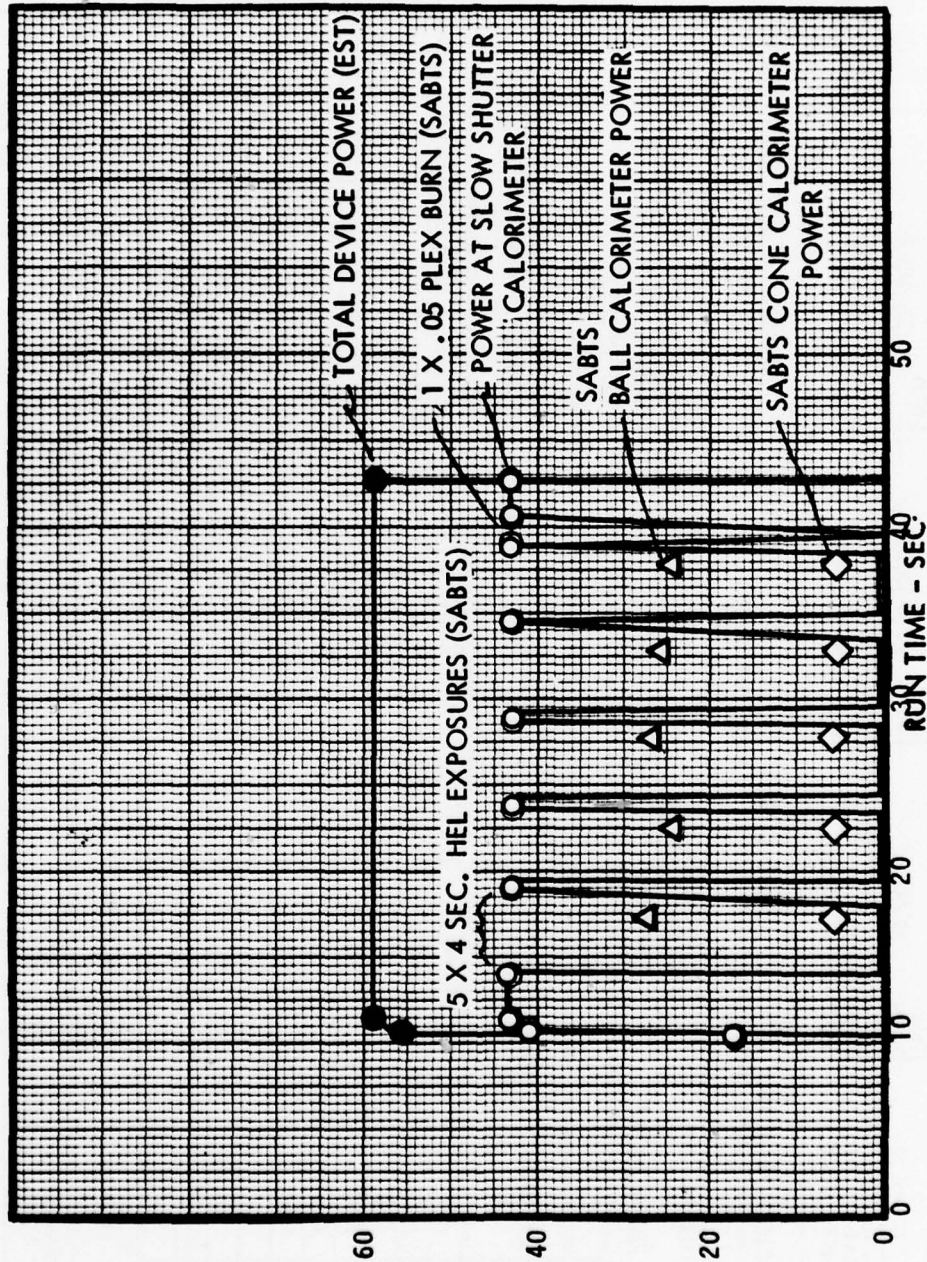
APPROX. TIME (SEC) _____

*NO DATA - COULD NOT RETRIEVE
DATA FROM SANGAMD RECORDER*

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY: J. Sank
1-28-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME							
11-264	SABTS	1-28-77	2007							
D2 FIRE VALVE OPEN (SEC)	10.4	D2 FIRE VALVE CLOSED (SEC)	42.7	LASING DURATION (SEC)	32.3	TOTAL COMPLETED TEST POSITIONS	6	PLANNED TOTAL PWR.	59	
PLANNED TEST NO. CE-12 TIME LINES				AS OF		DATE 1-28-77 REVISION ORIG				
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		3.5		CONFIGURATION				
D. MULLEN		PLANNED PEAK PWR DENSITY		38 KW/CM ²		REFLECTIVE		<input checked="" type="checkbox"/>		
						TRANSMISSIVE		<input type="checkbox"/>		
PLANNED				ACTUAL						
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	A1	PE	4.0	1.10	14.00	17.6	27.1	59.1	1.0	
2	A2	DOF	4.0	1.10	19.10		24.1		1	
3	A3	DOF	4.0	1.10	24.20		26.8			
4	A4	DCL1	4.0	1.10	29.30		25.8			
5	A5	DCL1	4.0	1.10	34.40		24.6		1.0	
6	A6	PLEX1	.11		39.50			59.2		
					39.61					
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		ON		O-GRAPH		MAN.	MAN.			
No. 2		"		SANGAMO No. 1		6.0	45.0			
No. 3		"		SANGAMO No. 2		N/A				
No. 4		"		SABTS SEC.		14.0	39.6			
				CALORIMETER (SABTS)		14.0	39.6			
SABTS INST.				CALORIMETER (SLOW SHUTTER)		10.0	14.0			
HI FLOW SOLENOID		10.0	43.0			39.6	43.0			

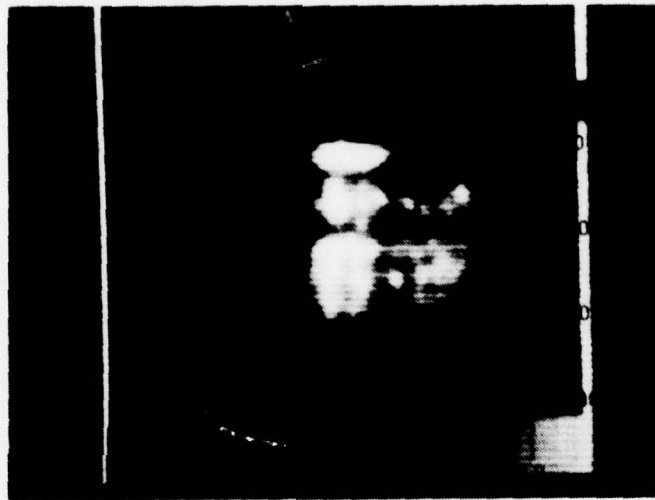
LASER PERFORMANCE ANALYSIS, RUN VL1-264

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

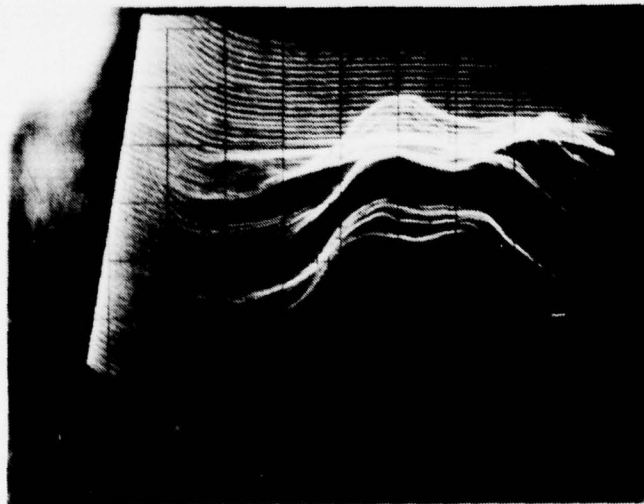
TOTAL INTENSITY

APPROX. TIME (SEC) 20



LINEAR PROFILE*

APPROX. TIME (SEC) 20



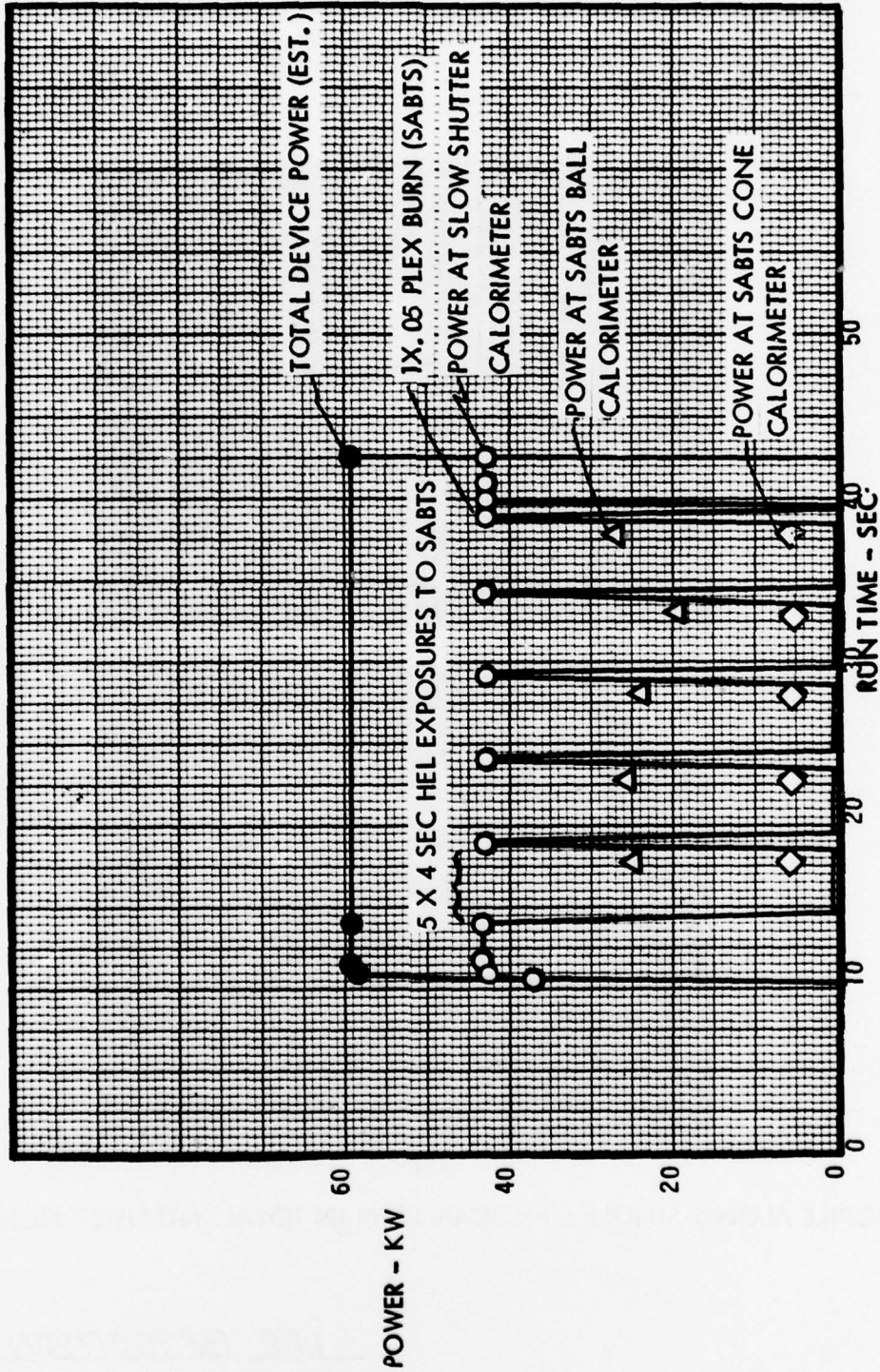
*PROFILE ALONG SINGLE LINE SCAN SEEN IN TOTAL INTENSITY PICTURE.

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-265

ESTIMATED POWER VS. TIME



REMARKS: _____

PREPARED BY: _____

J. SINGS
1-28-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA											
RUN NO.	TEST PLAN	DATE	TIME	DATE		TIME		PLANNED TOTAL PWR.			
VLI-265	SARTS	1-28-77	2145	1-28-77		2145		59			
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	42.5	LASING DURATION (SEC)	32.1	TOTAL COMPLETED TEST POSITIONS		6				
PLANNED TEST NO. CF-13 TIME LINES AS OF DATE 1-28-77 REVISION DRIG											
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		3.5		CONFIGURATION					
D. MULLEN		PLANNED PEAK PWR DENSITY		38 KW/CM ²		<input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE					
PLANNED											
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS	
1	C1	PE	4.0	1.10	19.00	17.9	24.8	59.3	1.0		
2	C2	DOF	4.0	1.10	19.10		25.9		1		
3	C3	DOF	4.0	1.10	24.20		23.6				
4	C4	OCLI	4.0	1.10	29.30		19.3				
5	C5	OCLI	4.0	1.10	34.40		27.2		1.0		
6	C6	PLEXI	.11		39.50			59.1			
					39.61						
ACTUAL											
ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH				MAN.			MAN.	
No. 2	"		SANGAMO No. 1				6.0			45.0	
No. 3	"		SANGAMO No. 2				N/A				
No. 4	"		SABTS SEC.				14.0			39.6	
			CALORIMETER (SABTS)				14.0			39.6	
SABTS INST.			CALORIMETER (SLOW SHUTTER)				10.0			14.0	
H1 FLOW SOLID/NOID	10.0	43.0	"	"	"		39.6			43.0	

LASER PERFORMANCE ANALYSIS, RUN VLI-265

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

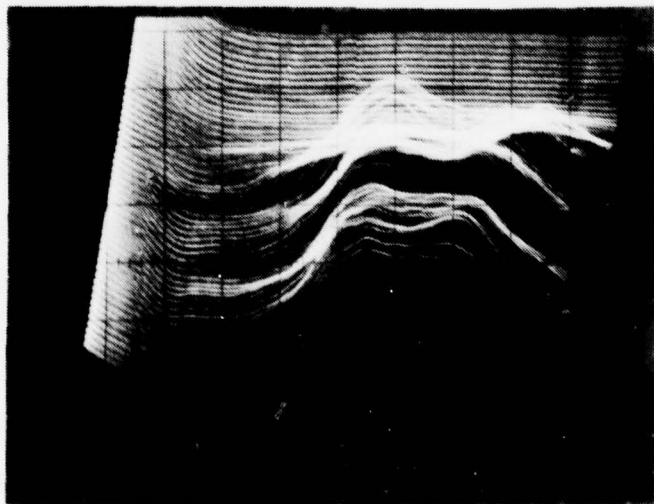
TOTAL INTENSITY

APPROX. TIME (SEC) 20



LINEAR PROFILE*

APPROX. TIME (SEC) 20

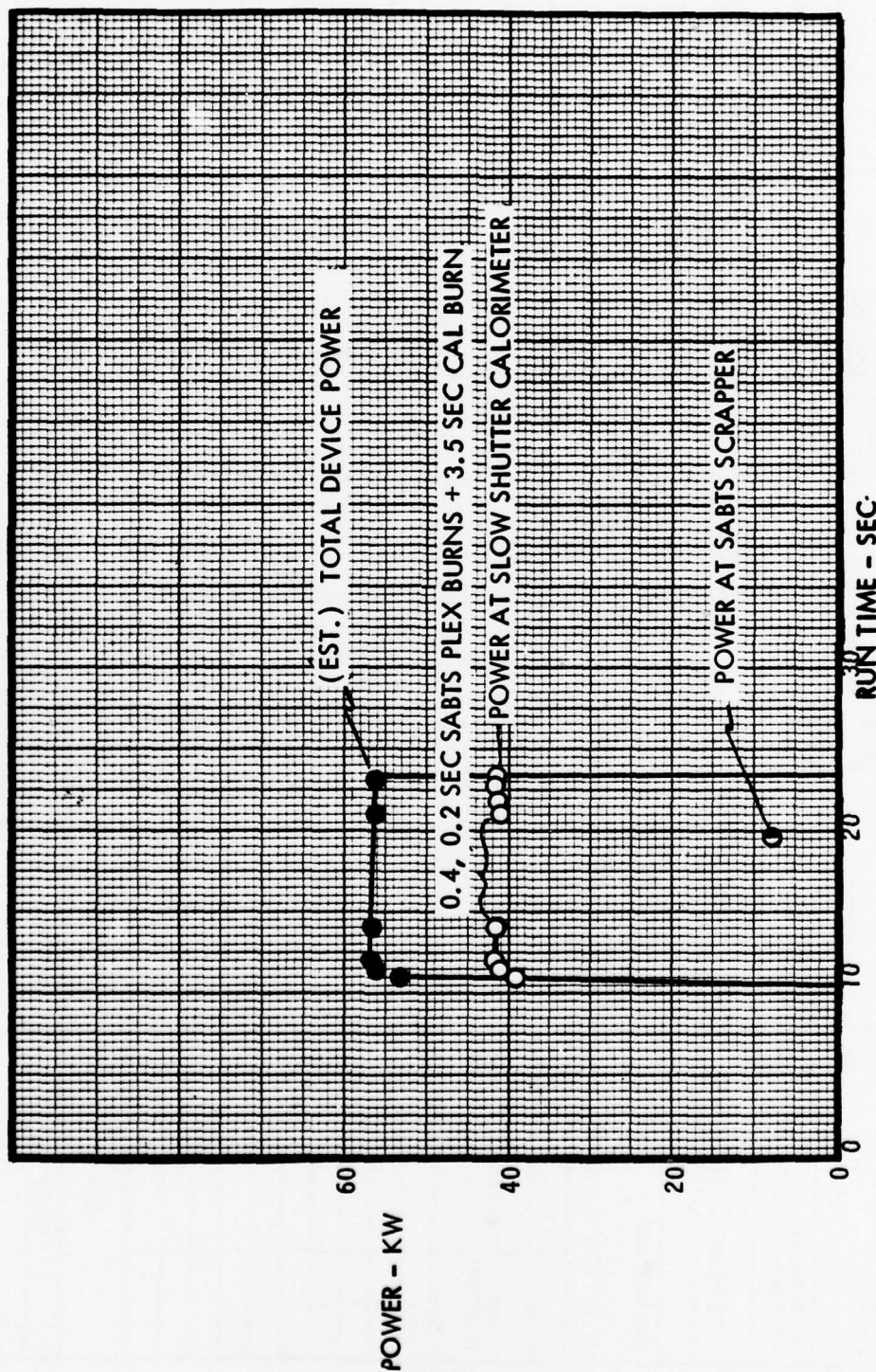


LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-266

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGS
2-8-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET										
QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME							
D2 FIRE VALVE	SABTS	2-8-77	2034							
OPER	D2 FIRE VALVE CLOSED (SEC)	23.2	LASING DURATION (SEC)	12.8	TOTAL COMPLETED TEST POSITIONS	3	PLANNED TOTAL PWR.	59		
PLANNED TEST NO. R-5		TIME LINES		AS OF		DATE 2-1-77		REVISION 00210		
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		CONFIGURATION						
D. MULLIEN		PLANNED PEAK PWR DENSITY 10 KW/CM ²		<input type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE						
PLANNED						ACTUAL				
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1		CONE CAL	4.0		12.0	13.5		57.6		
2		PLEXI 1	0.4	1.10	14.0					
3		PLEXI 2	0.2	1.10	15.5					
4		TUT TBI CAL	3.5		16.0					
5		CONE CAL	3.0		20.5	22.7		57.7		
6					23.3					
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		0.0		O-GRAPH		0.0		MAIN		
No. 2		1.1		SANGAMO No. 1		1.1		26.0		
No. 3		1.1		SANGAMO No. 2		N/A				
No. 4		1.1		SABTS SEQ.						
				CALORIMETER (SABTS)		1.1		20.3		
SABTS INST.				CALORIMETER (SLOW SHUTTER)		1.1		14.8		
41 FIRM SCHEDULE		10.0	23.3			11	11	23.3		

LASER PERFORMANCE ANALYSIS, RUN VL1-266

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) _____

LINEAR PROFILE*

APPROX. TIME (SEC) _____

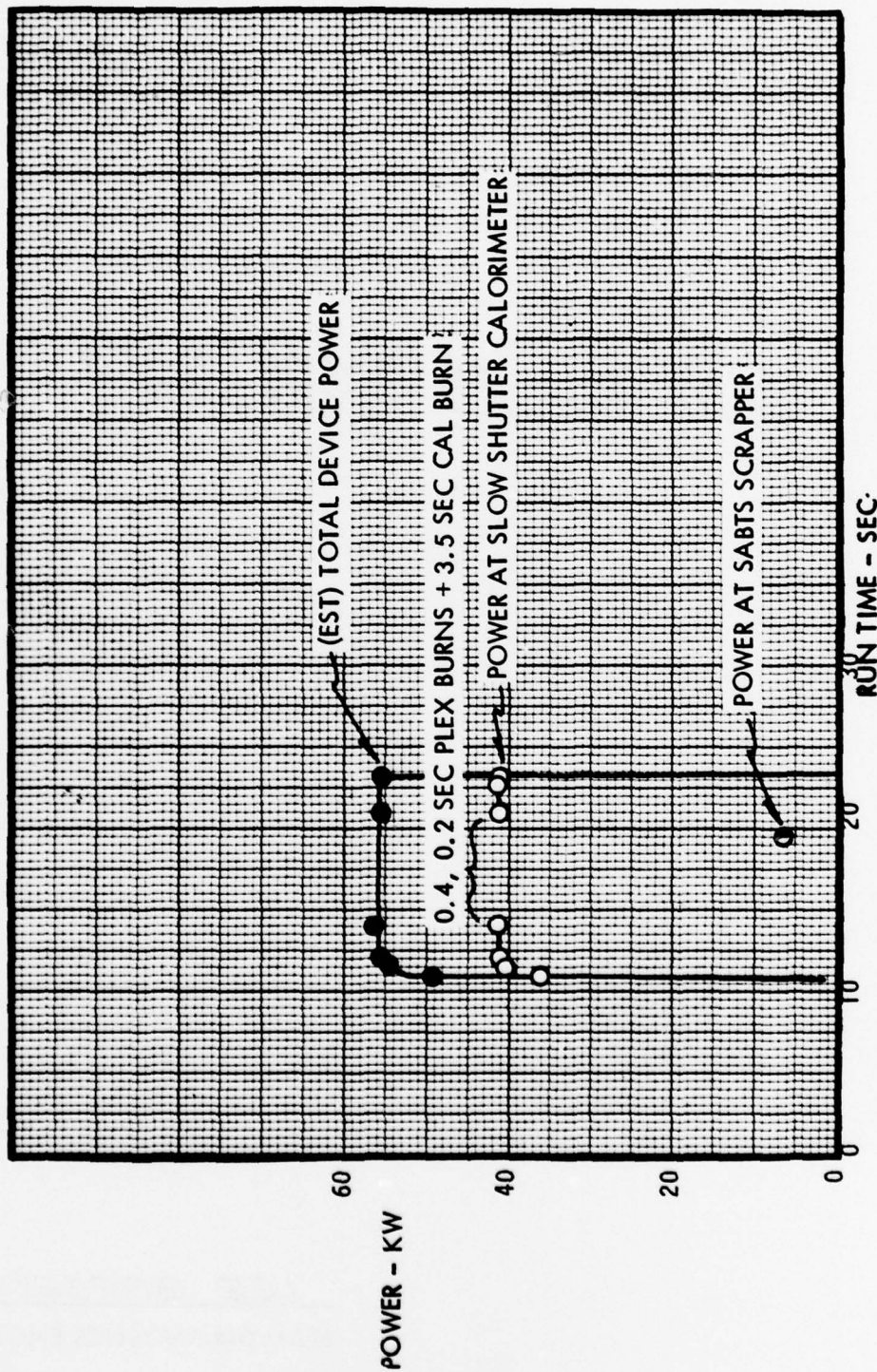
COULD NOT RETRIEVE DATA
FROM SANGAM RECORDER

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-267

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGS
2-8-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

PLANNED TIME LINES AND QUICK LOOK DATA SHEET									
QUICK LOOK TEST DATA									
RUN NO.	TEST PLAN	DATE	TIME	PLANNED TOTAL PWR.					
111-267	SAET-4	2-8-77	2338	59					
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	23.2	12.8	3					
PLANNED TEST NO. 76 TIME LINES AS OF DATE 2-7-77 REVISION 07/78									
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		CONFIGURATION					
D. MULLIN		PLANNED PEAK PWR DENSITY 45 KW/CM ²		<input type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE					
PLANNED									
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)					
1		LOWE LAL	4.0	10.0					
2		PLEXI 1	0.4	1.10					
3		PLEXI 2	0.2	1.10					
4		TOT APS LAL	3.5	16.8					
5		LOWE LAL	3.0	20.3					
6				23.3					
ACTUAL									
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)					
1		LOWE LAL	4.0	10.0					
2		PLEXI 1	0.4	1.10					
3		PLEXI 2	0.2	1.10					
4		TOT APS LAL	3.5	16.8					
5		LOWE LAL	3.0	20.3					
6				23.3					
ITEM									
ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)					
TV CAMERA No. 1	DN		O-GRAPH	N/A					
No. 2	"		SANGAMO No. 1	6.0					
No. 3	"		SANGAMO No. 2	N/A					
No. 4	"		SABTS SEQ.	16.6					
SABTS INST.			CALORIMETER (SABTS)	18.0					
171 FLOW SILENCED	10.0	23.3	CALORIMETER (SLOW SHUTTER)	20.3					
			"	21.5					

LASER PERFORMANCE ANALYSIS, RUN VLI-267

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) _____

LINEAR PROFILE*

APPROX. TIME (SEC) _____

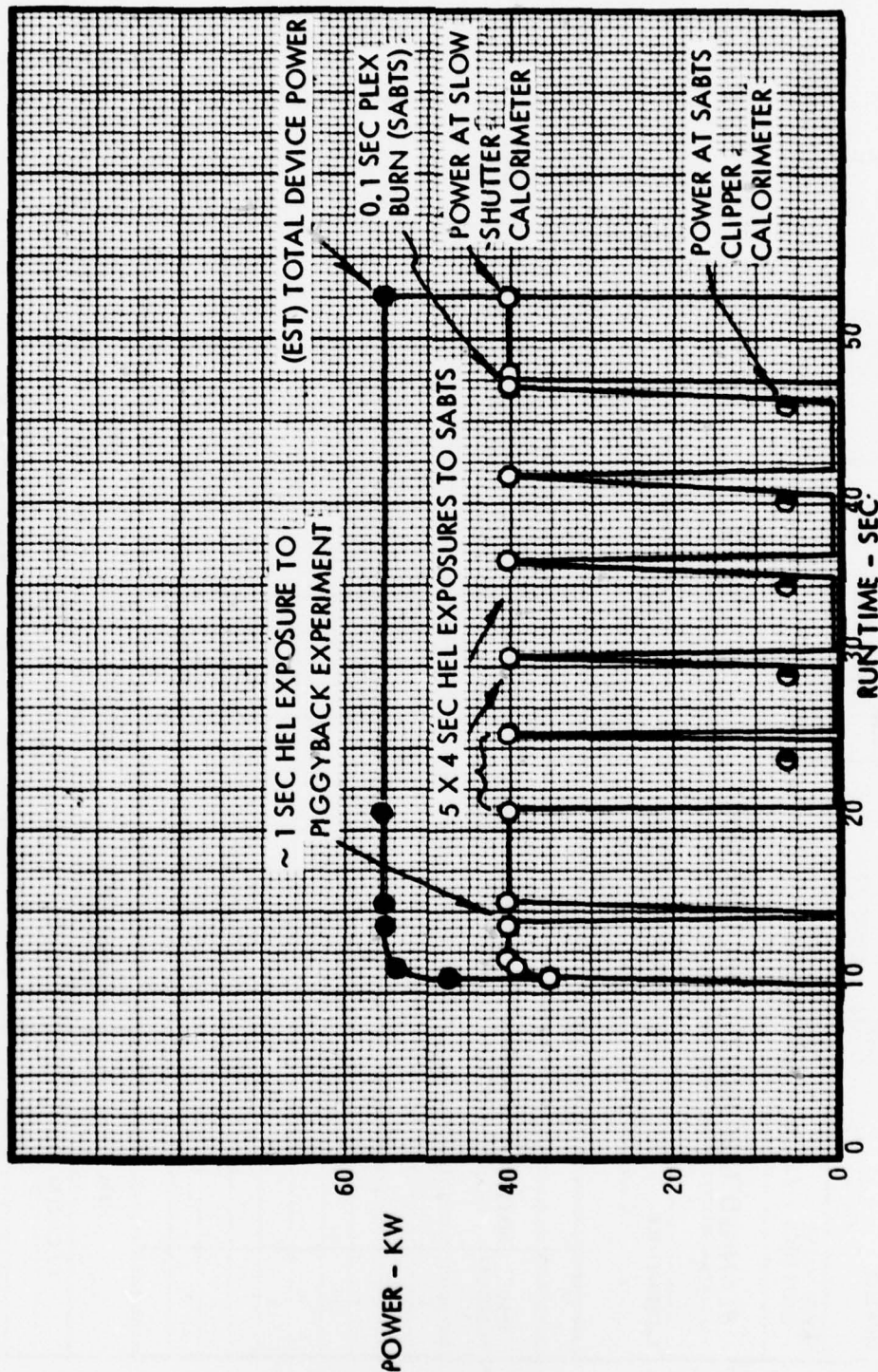
COULD NOT RETRIEVE DATA
FROM SECOND TURN FLAT

LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-268

ESTIMATED POWER VS. TIME



REMARKS: _____

PREPARED BY: _____

V. S. NG
2-10-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

RUN NO.	TEST PLAN	DATE	TIME
71-008	SABTS	2-9-77	2111
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	LASING DURATION (SEC)	TOTAL COMPLETED TEST POSITIONS
104	52.4	42.0	7
			PLANNED TOTAL PWR.
			5.4

PLANNED TEST NO. 0076/001 TIME LINES AS OF DATE 2-9-77 REVISION 1

EXPERIMENTER	PLANNED LINEAR MAGNIFICATION	CONFIGURATION
C. MULLEN	1.7	<input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE
	PLANNED PEAK PWR DENSITY	
	10 KW/CM ²	

TEST POSITION	PLANNED					ACTUAL			
	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER
1	100	PL-X1	1.0	6.50	14.00				
2									
3	1	PE	4.0	7.10	21.50				
4		DN	4.0	7.10	26.00				
5		DN	4.0	7.10	31.70				
6		DN	4.0	7.10	36.80				
		100/100	4.0	7.10	41.90				
		25X1	7.0		47.00				
					47.11				

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
T/CAMERA No. 1	0.0		O-GRAPH	0.0	0.0
No. 2	"		SANGAMO No. 1	0.0	
No. 3	"		SANGAMO No. 2	0.0	
No. 4	"		SABTS SEQ.	0.0	47.1
WALL THERMOMETER	11.0	18.00	CALORIMETER (SABTS)	0.0	47.1
SABTS INST.			CALORIMETER (SLOW SHUTTER)	0.0	14.0
THE THERMOMETER	10.0	52.6		0.0	21.5
THE THERMOMETER	10.0			0.0	52.6

LASER PERFORMANCE ANALYSIS, RUN VLI-268

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURV FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) _____

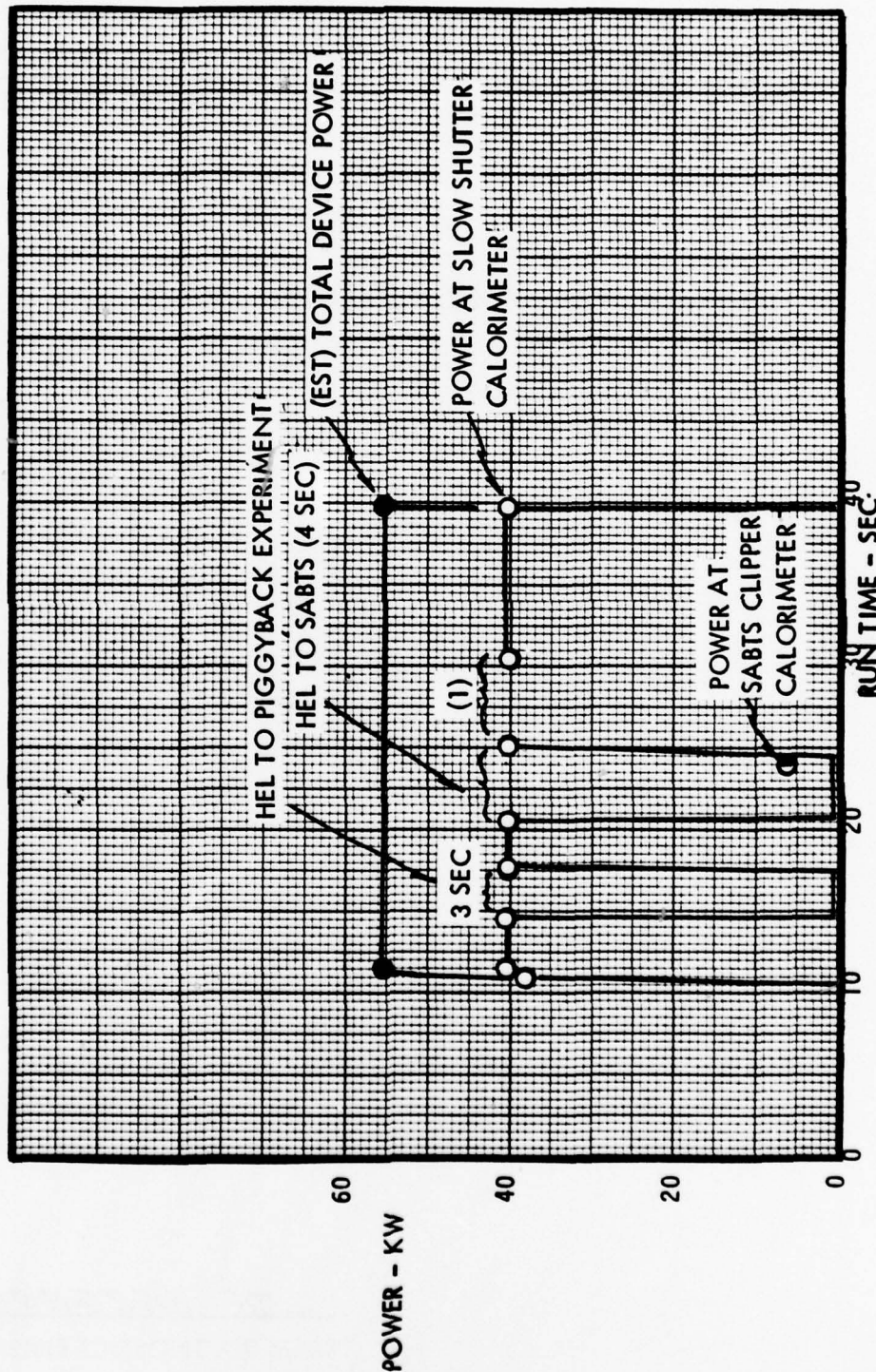
LINEAR PROFILE*

APPROX. TIME (SEC) _____

*SANGAMO RECORDER NOT
OPERATIVE*

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-269

ESTIMATED POWER VS. TIME



REMARKS: (1) CAROUSEL INDEXED AFTER 1st SAMPLE BURNED THROUGH.

PREPARED BY:

J. SINGS

2-10-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA	
TEST PLAN	DATE
DATE	TIME
PLANNED TOTAL PWR.	PLANNED TOTAL PWR.
TEST POSITIONS	TEST POSITIONS
5	5

DATE 2-9-77 REVISION 11

PLANNED TEST NO. 001/002 TIME LINES

AS OF

CONFIGURATION
☐ REFLECTIVE
☒ TRANSMISSIVE

PLANNED LINEAR MAGNIFICATION 1.7
 PLANNED PEAK PWR DENSITY 10 KW/CM²

EXPERIMENTER
 D. MULLEN

TEST POSITION	SPECIMEN NO.	COATING DESIGN	PLANNED			ACTUAL			COMMENTS
			EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM t_2	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER
1			3.0	4.5	14.00	13.5		56.8	
2									
3	*	PE	4.0	1.10	21.50	20.7		57.2	
4		DOF	4.0	1.10	26.60				
5		DOF	4.0	1.10	31.70				
6	*	PETTY	4.0	1.10	36.80	36.0		57.0	
		PETTY	4.0	1.10	41.90				
		FLEXI	4.11		47.00				
					47.11				
NOTE: TEST ABORTED WHEN CALORIMETER CAUGHT FIRE									

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAH	10.0	10.0
No. 2	"		SANGAMO No. 1	10.0	10.0
No. 3	"		SANGAMO No. 2	10.0	10.0
No. 4	"		SABTS SEQ.	21.5	21.5
WIND TUNNEL	11.0	10.00	CALORIMETER (SABTS)	21.5	21.5
SABTS INST.			CALORIMETER (SLOW SHUTTER)	10.0	10.0
14 TUN WIND TUNNEL	10.0	32.6		15.0	21.5
END OF 1				47.1	52.6

LASER PERFORMANCE ANALYSIS, RUN VLI-269

BEAM INTENSITY PROFILE

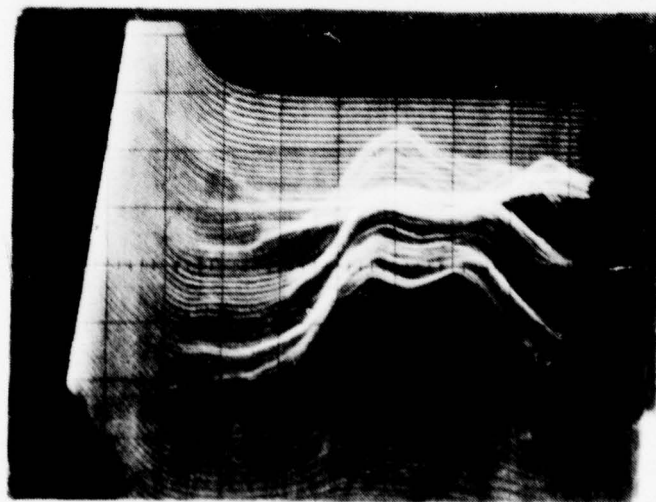
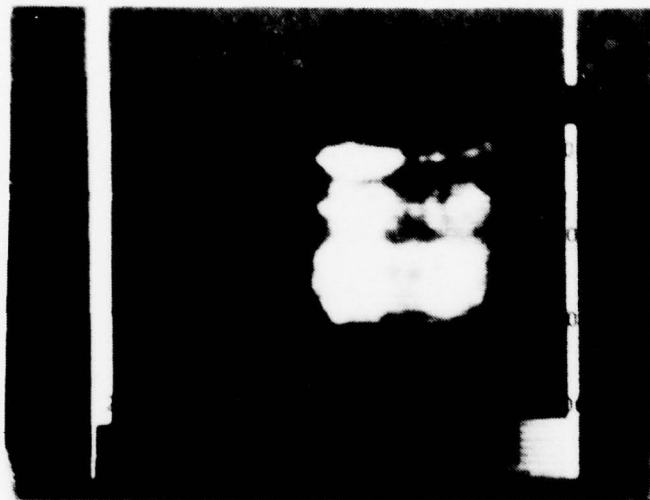
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) 20

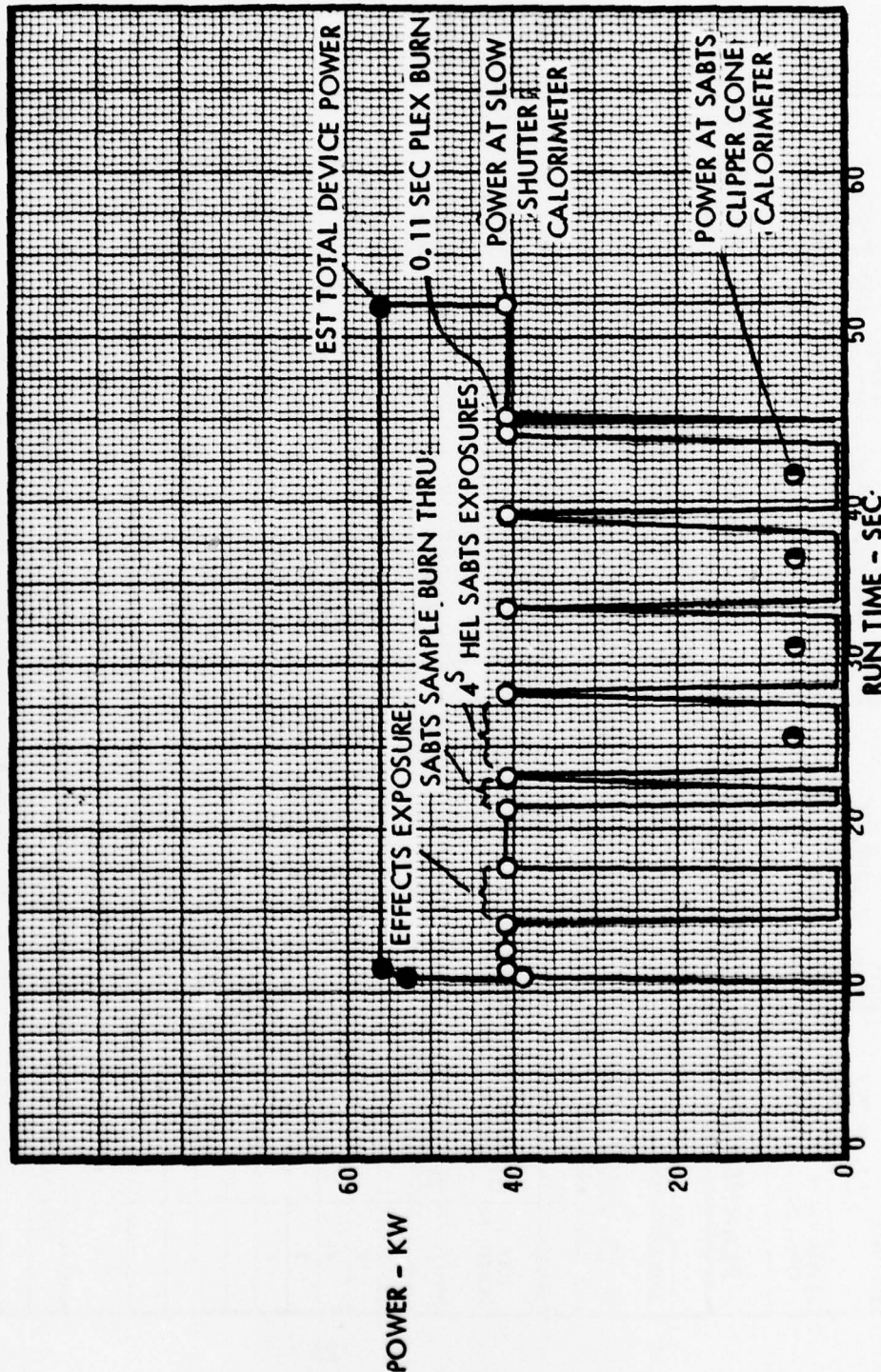


LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-270

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. Sines
2-11-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA				
RUN NO. VLI-270	TEST PLAN SABTS	DATE 2-10-77	TIME 1935	
D2 FIRE VALVE OPEN (SEC) 10.4	D2 FIRE VALVE CLOSED (SEC) 51.9	LASING DURATION (SEC) 41.5	TOTAL COMPLETED TEST POSITIONS 7	PLANNED TOTAL PWR. 59
PLANNED TEST NO. 0ETZ/0A3 TIME LINES AS OF DATE 2-10-77 REVISION DRIG				

EXPERIMENTER	PLANNED LINEAR MAGNIFICATION	CONFIGURATION
	D. MULLEN	1.7

		PLANNED				ACTUAL				
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM f_2	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	PLEXI		3.0	4.5	14.00	13.0		57.2		
2										
3	*	PE	4.0	1.10	21.50	20.7		56.8		
4		DOF	4.0	1.10	26.00					
5		DOF	4.0	1.10	31.70					
6		HOUSE	4.0	1.10	36.80					
	*	HOUSE	4.0	1.10	41.90					
		PLEXI	0.11		47.00					
					47.11	50.9		56.9		

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH	MON.	MAN
No. 2	"		SANGAMO No. 1	6.0	54.0
No. 3	"		SANGAMO No. 2	N/A	
No. 4	"		SABTS SEQ.	21.5	47.1
WIND TUNNEL	11.0	18.00	CALORIMETER (SABTS)	21.5	47.1
SABTS INST.			CALORIMETER (SLOW SHUTTER)	10.0	14.0
HI FLOW SOLENOID	10.0	52.6	" " " "	15.0	21.5
EFFECTS MIRROR	END OF 1		" " " "	47.1	52.6

LASER PERFORMANCE ANALYSIS, RUN VL1-270

BEAM INTENSITY PROFILE

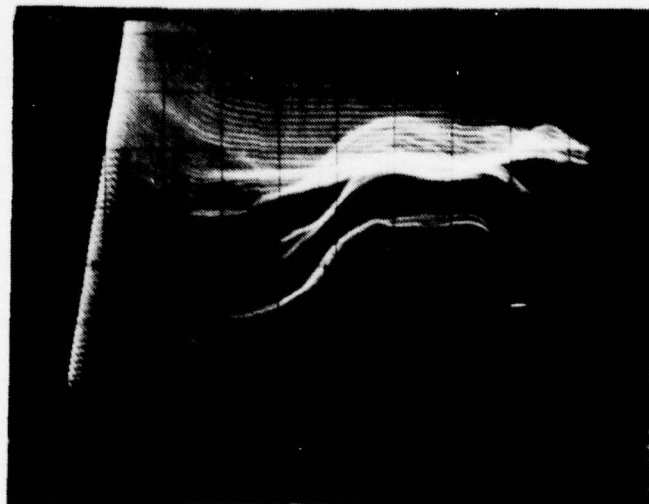
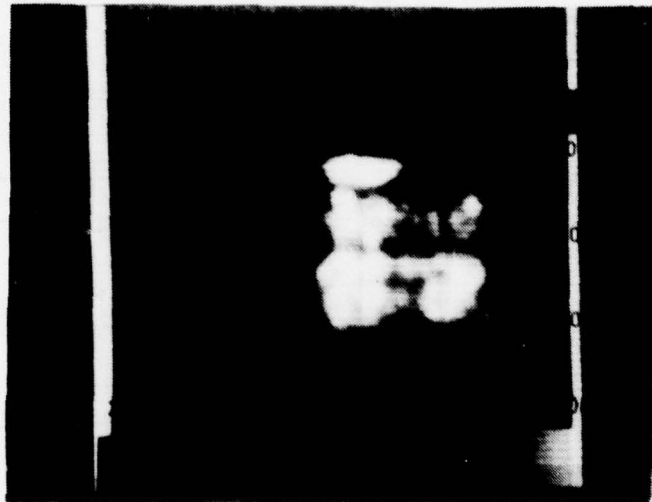
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

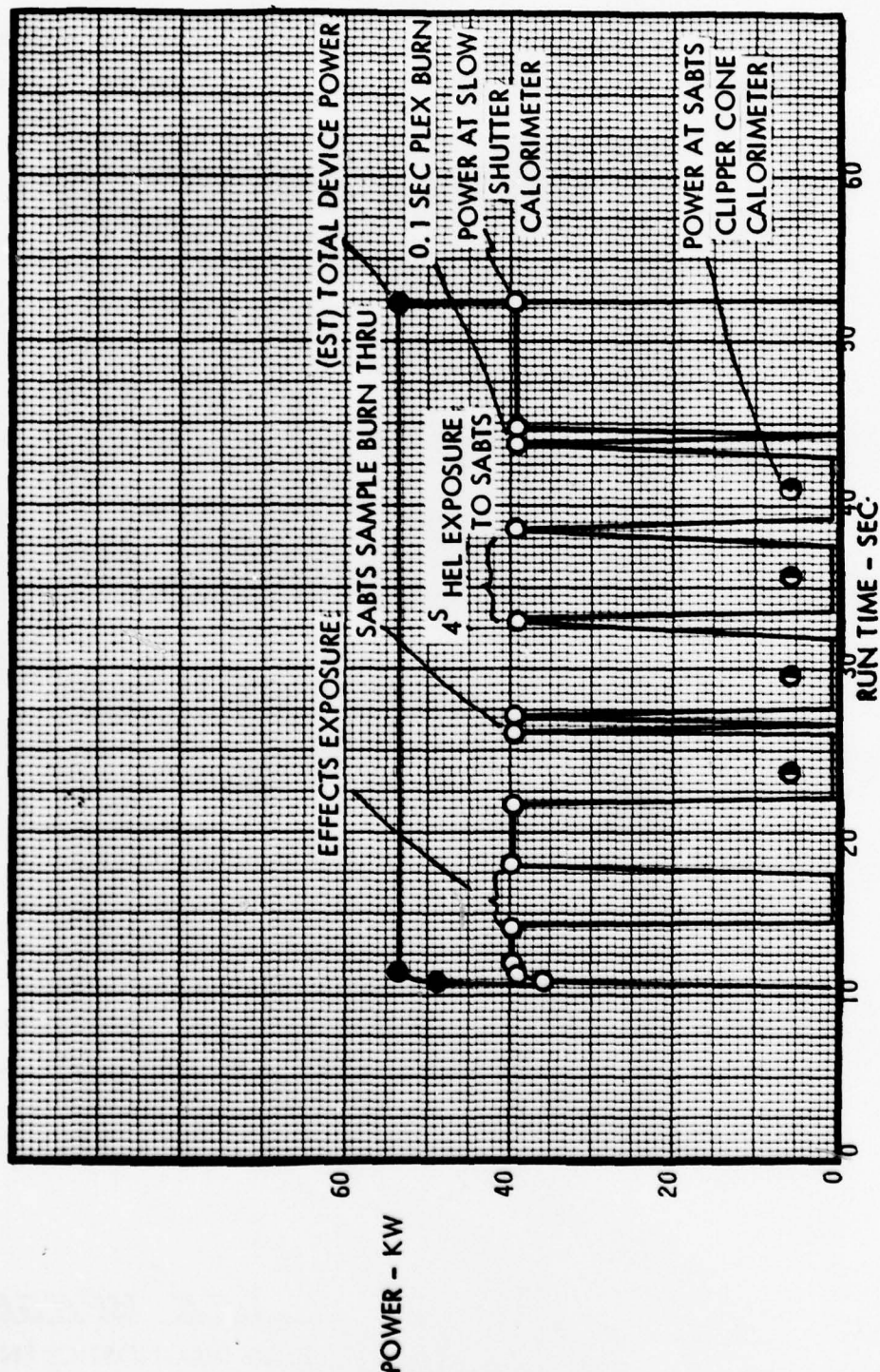
APPROX. TIME (SEC) 20



LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGS
2-11-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO. VLI-271		TEST PLAN SABTS	DATE 2-10-77	TIME 2209						
D2 FIRE VALVE OPEN (SEC) 10.4		D2 FIRE VALVE CLOSED (SEC) 52.4	LASING DURATION (SEC) 42.0	TOTAL COMPLETED TEST POSITIONS 7	PLANNED TOTAL PWR. 59					
PLANNED TEST NO. 0E2/RC1 TIME LINES					AS OF DATE 2-10-77 REVISION A					
EXPERIMENTER D. MULLEN		PLANNED LINEAR MAGNIFICATION 1.7	CONFIGURATION <input type="checkbox"/> REFLECTIVE <input checked="" type="checkbox"/> TRANSMISSIVE							
		PLANNED PEAK PWR DENSITY 10 KW/CM²								
PLANNED			ACTUAL							
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	RC1		3.0	4.5	14.00	13.5		55.8		
2										
3	* DDF		4.0	1.10	21.50	21.2		55.5		
4	PE		4.0	1.10	26.60					
5	DDF		4.0	1.10	31.70					
6	PETTY		4.0	1.10	36.80					
	* PETTY		4.0	1.10	41.90					
	FLXI		0.11		47.00			55.6		
					47.11	51.9				
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		ON		O-GRAPH		MAN.	MAN.			
No. 2		"		SANGAMO No. 1		6.0	54.0			
No. 3		"		SANGAMO No. 2		N/A				
No. 4		"		SABTS SEQ.		21.5	47.1			
WIND TUNNEL		11.0	18.00	CALORIMETER (SABTS)		21.5	47.1			
SABTS INST.				CALORIMETER (SLOW SHUTTER)		10.0	14.0			
HI FLOW SOLENOID		10.0	52.6			11	11	15.0	21.5	
EFFECTS MIRROR		END OF 1				11	11	47.1	52.6	

* PRINTER

REF:TCR ML21368

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OF 4

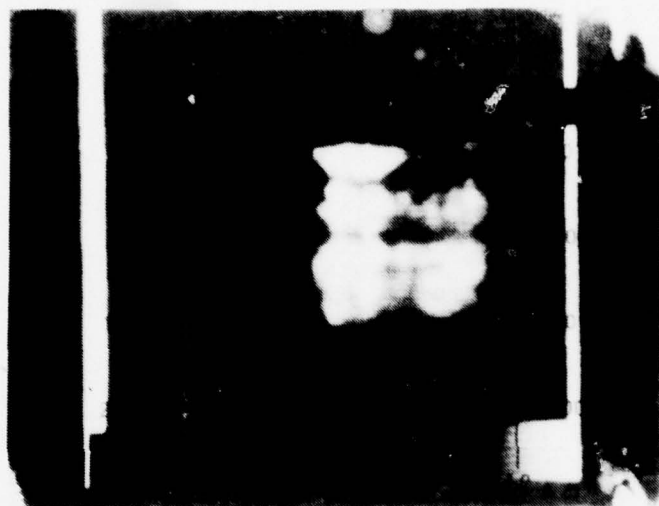
LASER PERFORMANCE ANALYSIS, RUN VL1-211

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING FIRST TURN FLAT

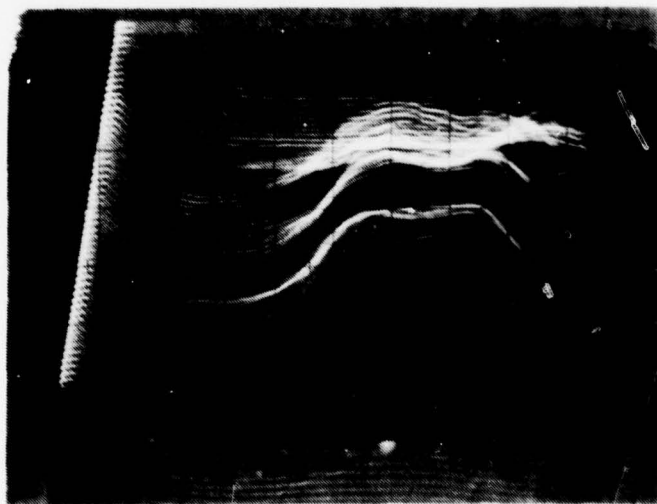
TOTAL INTENSITY

APPROX. TIME (SEC) 20



LINEAR PROFILE*

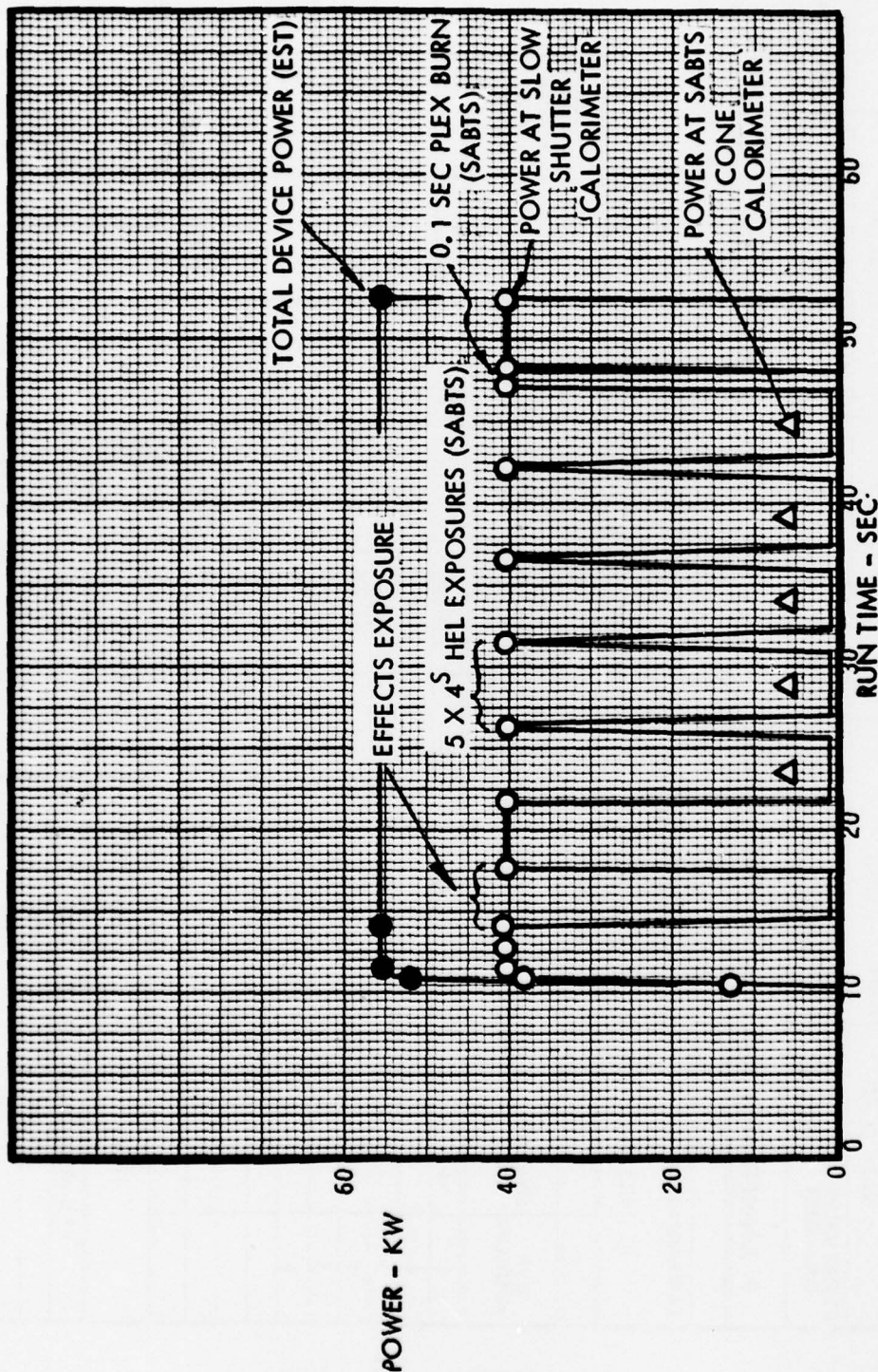
APPROX. TIME (SEC) 20



LEE BERGERSON

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-272

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. Sines
2-11-77

Δ

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA

RUN NO.	VL1- 272	TEST PLAN	SABTS	DATE	2-11-77	TIME	1920
D2 FIRE VALVE OPEN (SEC)	10.4	D2 FIRE VALVE CLOSED (SEC)	52.4	LASING DURATION (SEC)	42.0	TOTAL COMPLETED TEST POSITIONS	7
						PLANNED TOTAL PWR.	59

PLANNED TEST NO. 0023/M1 TIME LINES AS OF DATE 2-11-77 REVISION A

EXPERIMENTER	PLANNED LINEAR MAGNIFICATION	1.7	CONFIGURATION	<input type="checkbox"/> REFLECTIVE
D. MULLEN	PLANNED PEAK PWR DENSITY	10 kw/cm ²		<input checked="" type="checkbox"/> TRANSMISSIVE

PLANNED						ACTUAL			COMMENTS
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	
1	M1		3.0	4.5	14.00	14.0		57	
2									
3	*	DOF	4.0	1.10	21.50	20.7		57	
4		PIE	4.0	1.10	26.60				
5		DOF	4.0	1.10	31.70				
6		PETTY	4.0	1.10	36.80				
	*	PETTY	4.0	1.10	41.90				
		PLATE	.11		47.00				
					47.11	51.4		56.5	

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH	MAN.	MAN.
No. 2	ON		SANGAMO No. 1	6.0	54
No. 3	ON		SANGAMO No. 2	N/A	
No. 4	ON		SABTS SEQ.	21.5	47.1
WIND TUNNEL	11.0	18.00	CALORIMETER (SABTS)	21.5	47.1
SABTS INST.			CALORIMETER (SLOW SHUTTER)	10.0	14.0
HI FLOW SOLENOID	10.0	52.6		15.0	21.5
EFFECT MIRROR	END OF 1			47.1	52.6

*Profiler

LASER PERFORMANCE ANALYSIS, RUN VLI 272

BEAM INTENSITY PROFILE

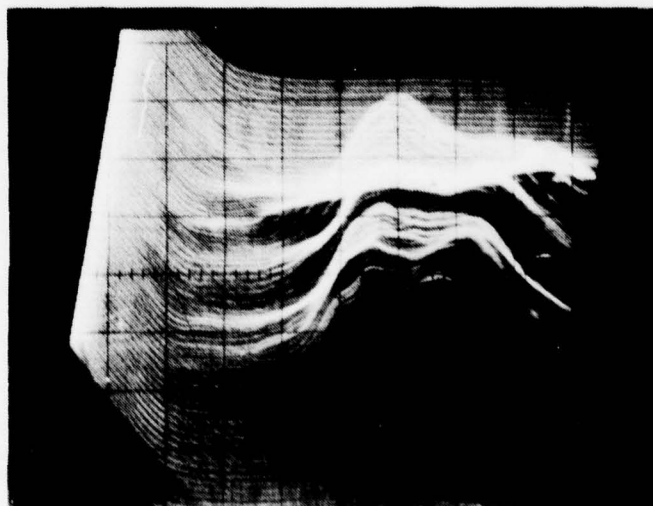
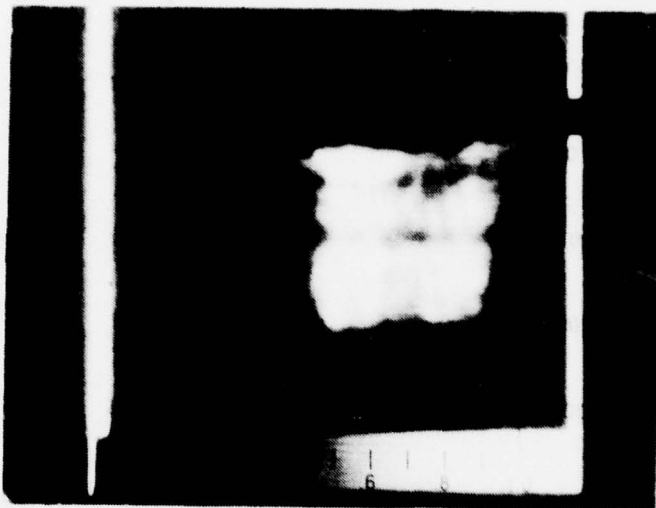
AS SEEN BY IR CAMERA VIEWING FIRST TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) 20

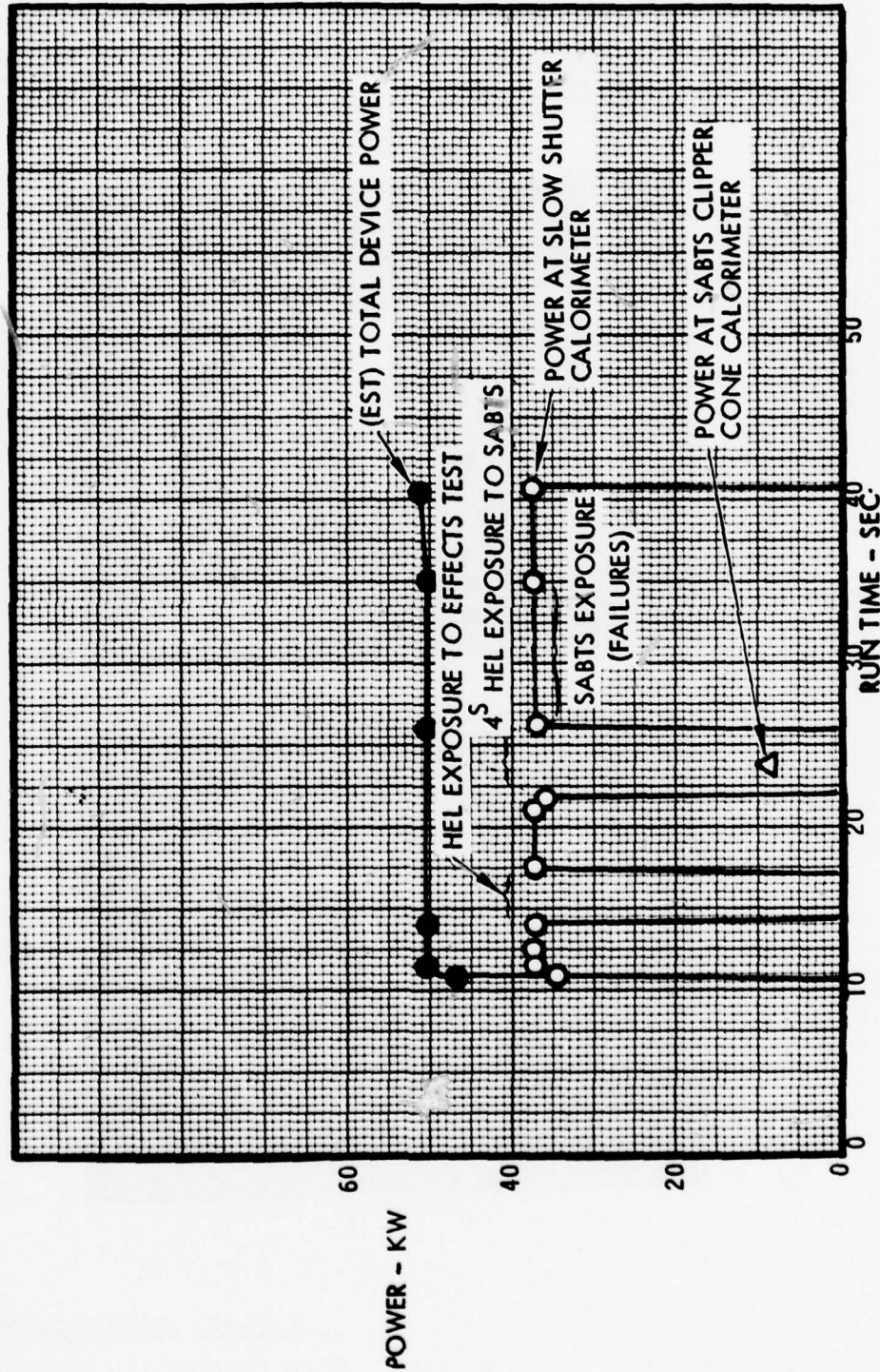


LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-273

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGH
2-16-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET										
QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	SABTS	DATE	TIME						
VLL-273			2-15-77	2113						
D2 FIRE VALVE OPEN (SEC)	10.4	D2 FIRE VALVE CLOSED (SEC)	40.7	LASING DURATION (SEC)	30.3	TOTAL COMPLETED TEST POSITIONS	5	PLANNED TOTAL PWR.	59	
PLANNED TEST NO. 054 / 30 TIME LINES					AS OF DATE 2-14-77 REVISION A					
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		1.7		CONFIGURATION				
D. MULLEN		PLANNED PEAK PWR DENSITY		10 kw/cm ²		REFLECTIVE		TRANSMISSIVE		
TEST POSITION		COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	SCSI		3.0	4.5	14.00	13.0		53.3		
2										
3	*	DOF	4.0	1.10	21.50	20.7		53.6		
4		PE	4.0	1.10	26.60					
5		DOF	4.0	1.10	31.70					
6		PETTY	4.0	1.10	36.80					
	*	PETTY	4.0	1.10	41.90	39.6		53.9		
		PLAHI	.11		47.00					
					47.11					
NOTE: TEST TERMINATED AFTER FIFTH SABTS SPECIMEN.										
ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)					
TV CAMERA No. 1	ON		O-GRAPH	MAN.	MAN.					
No. 2	ON		SANGAMO No. 1	6.0	54					
No. 3	ON		SANGAMO No. 2	N/A						
No. 4	ON		SABTS SEQ.	21.5	47.1					
WIND TUNNEL	11.0	18.00	CALORIMETER (SABTS)	21.5	47.1					
SABTS INST.			CALORIMETER (SLOW SHUTTER)	10.0	14.0					
HI FLOW SOLENOID	10.0	52.6		15.0	21.5					
EFFECT MIRROR	END OF 1			47.1	52.6					

*Pr. filer

REF: TCR M421970

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OF 4

LASER PERFORMANCE ANALYSIS, RUN VLI-273

BEAM INTENSITY PROFILE

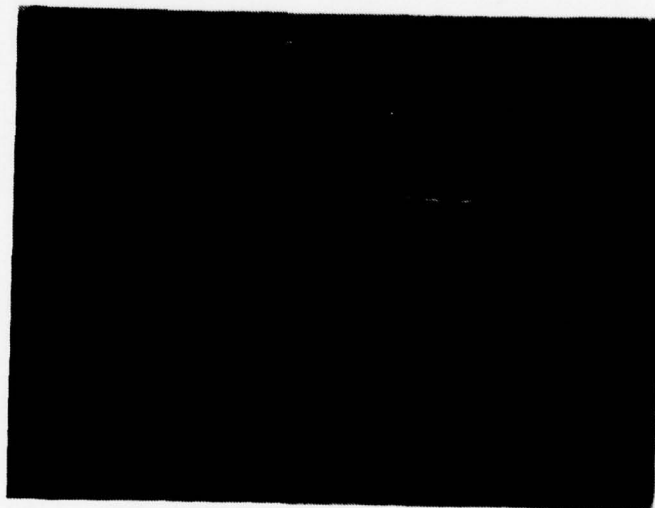
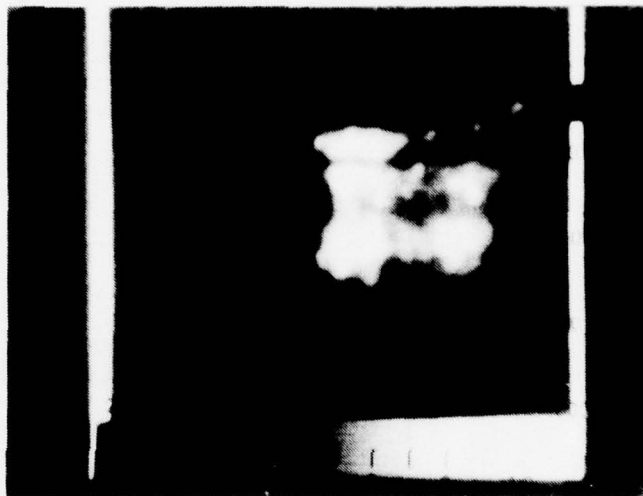
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

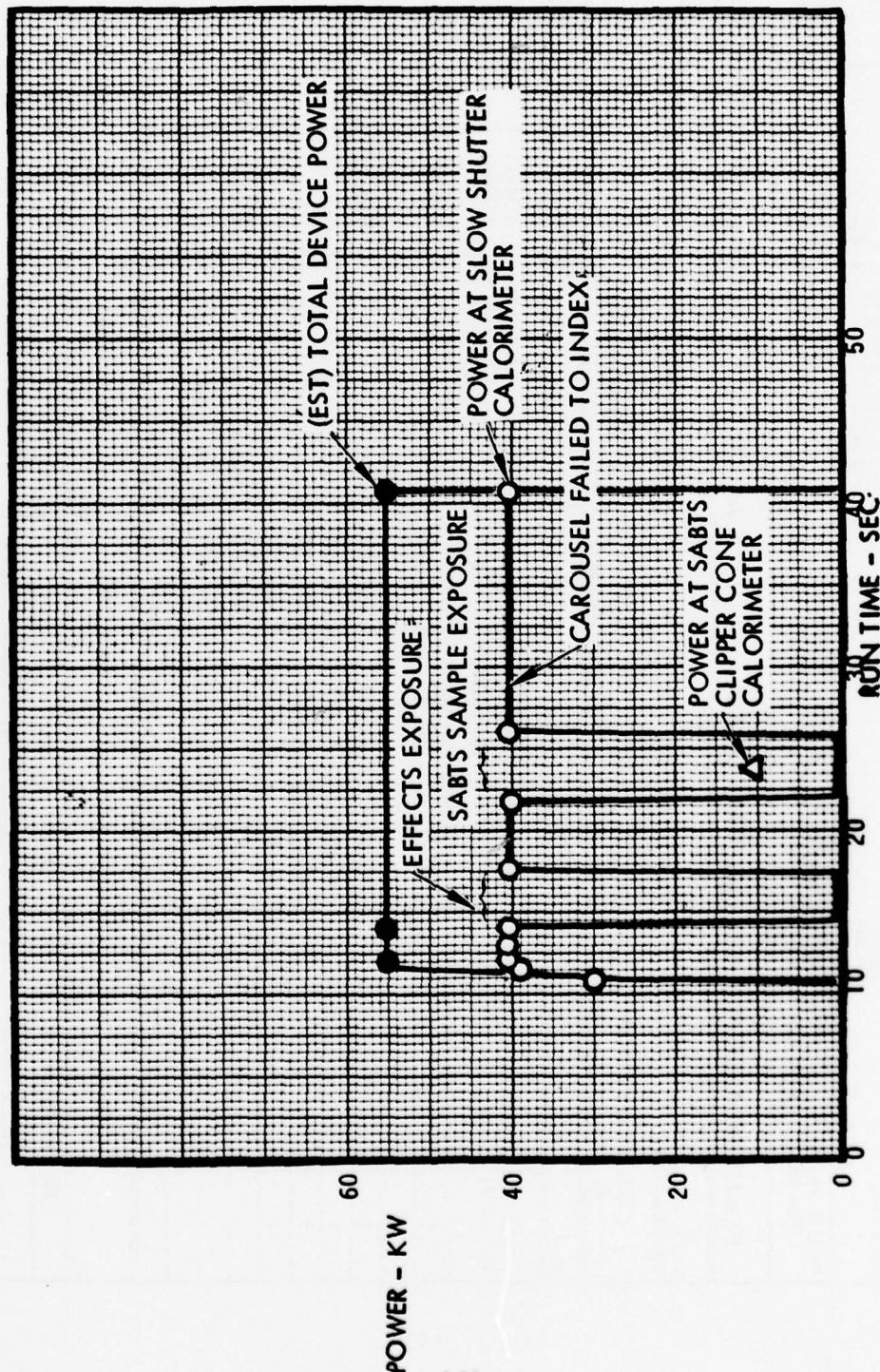
LINEAR PROFILE*

APPROX. TIME (SEC) 20



LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-274

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. Sings
2-17-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET										
QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME							
VLI - 274	SABTS	2-16-77	2316							
D2 FIRE VALVE OPEN (SEC)	10.4	D2 FIRE VALVE CLOSED (SEC)	40.7	LASING DURATION (SEC)	30.3	TOTAL COMPLETED TEST POSITIONS	2	PLANNED TOTAL PWR.	59	
PLANNED TEST NO. 0648/MS/1 TIME LINES				AS OF		DATE 2-16-77 REVISION A				
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		CONFIGURATION						
D. MULLEN		1.7		<input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE						
R. DELYGER		PLANNED PEAK PWR DENSITY 10 KW/CM ²								
PLANNED				ACTUAL						
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	5512		3.0	4.5	19.00	14.0		56.9		
2										
3	#		4.0	1.10	21.50	20.7		56.6		
4			4.0	1.10	26.60					
5			4.0	1.10	31.70					
6	#		4.0	1.10	36.80					
			.10		41.90	40.1		56.6		
					42.00					
NOTE: CASSETTE DID NOT INDEX TO SECOND POSITION.										
ITEM	START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)				
TV CAMERA No. 1	ON		O-GRAPH		MAN.	MAN.				
No. 2	"		SANGAMO No. 1		6.0	48.0				
No. 3	"		SANGAMO No. 2		N/A					
No. 4	"		SABTS SEQ.		21.5	42.0				
WIND TUNNEL SABTS INST.	11.0	18.0	CALORIMETER (SABTS)		21.5	42.0				
			CALORIMETER (SLOW SHUTTER)		10.0	14.0				
H1 FLOW SOLAR	10.0	46.0			17.0	21.5				
EFFICIENT MIRROR END OF 1					42.0	46.0				

* PROFILER

REF: TCR ML 21370

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OF 4

LASER PERFORMANCE ANALYSIS, RUN VLI-274

BEAM INTENSITY PROFILE

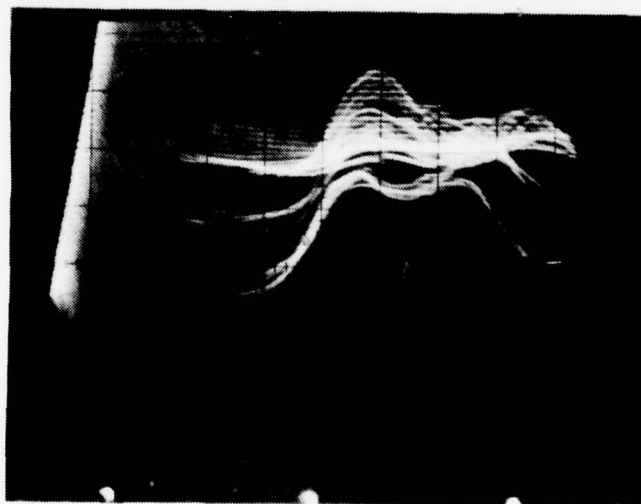
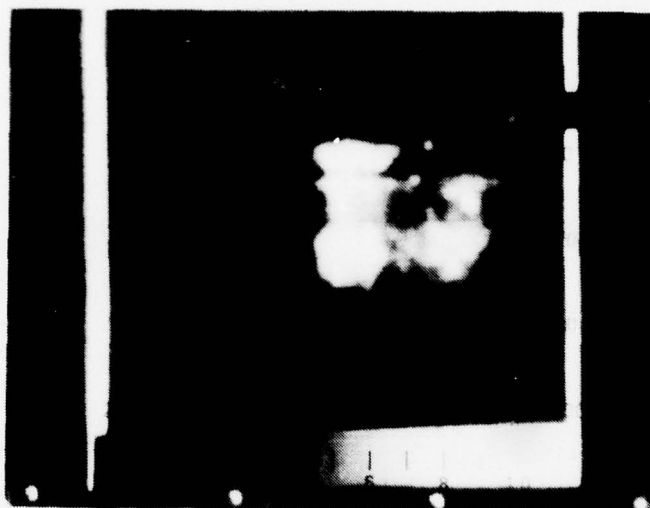
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

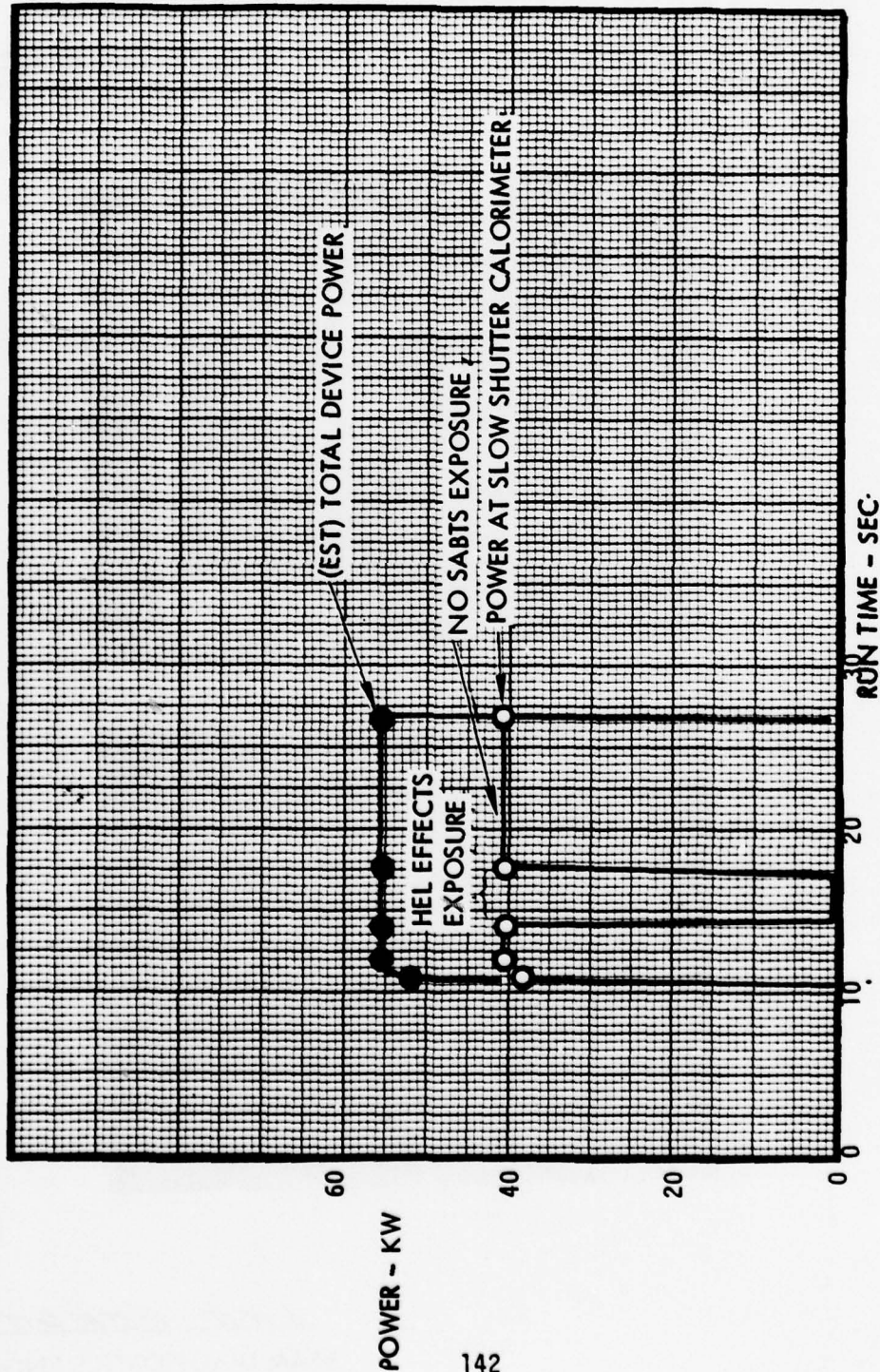
LINEAR PROFILE*

APPROX. TIME (SEC) 20



LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-275

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. Saks
2-18-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME							
VLI-275	SABTS	2-17-77	2048							
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	LASING DURATION (SEC)	TOTAL COMPLETED TEST POSITIONS	PLANNED TOTAL PWR. 59						
9.9	26.8	16.9	1							
PLANNED TEST NO. 0619/HSC TIME LINES AS OF DATE 2-17-77 REVISION B										
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION	1.7	CONFIGURATION						
D. MULLEN		PLANNED PEAK PWR DENSITY	10 KW/cm ²	<input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE						
R. DELYER										
PLANNED				ACTUAL						
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	HSC12		3.0	4.5	14.00	13.0		56.8		
2										
3		DOF	4.0	1.60	21.50	25.8		57.0		
4		DOF	4.0	1.60	27.10					
5		PE	4.0	1.60	32.70					
6		PE	4.0	1.60	38.30					
		PLAY1	.10		43.90					
					44.00					
NOTE: EFFECTS MIRROR MICRO DROPPED OUT PREVENTING SABTS TEST.										
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		ON		O-GRAPH		MAN.	MAN.			
No. 2		"		SANGAMO No. 1		6.0	50.0			
No. 3		"		SANGAMO No. 2		N/A				
No. 4		"		SABTS SEQ.		21.5	44.0			
WIND TUNNEL		11.0	18.0	CALORIMETER (SABTS)		21.5	44.0			
SABTS INST.				CALORIMETER (SLOW SHUTTER)		10.0	14.0			
HI FLOW SQUARE		10.0	48.0			17.0	21.5			
EFFECTS MIRROR		END OF 1				44.0	48.0			
# PROFILER										

LASER PERFORMANCE ANALYSIS, RUN VLI-275

BEAM INTENSITY PROFILE

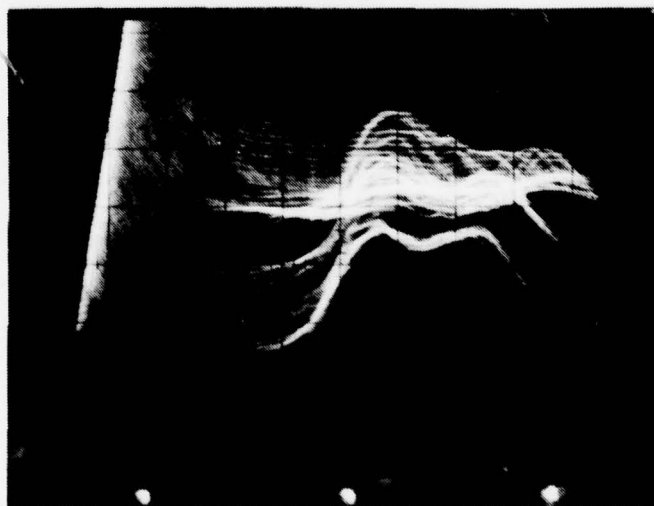
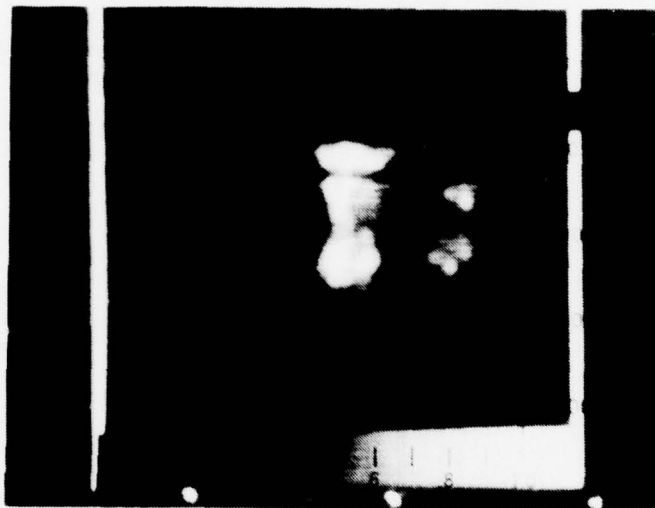
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) 20

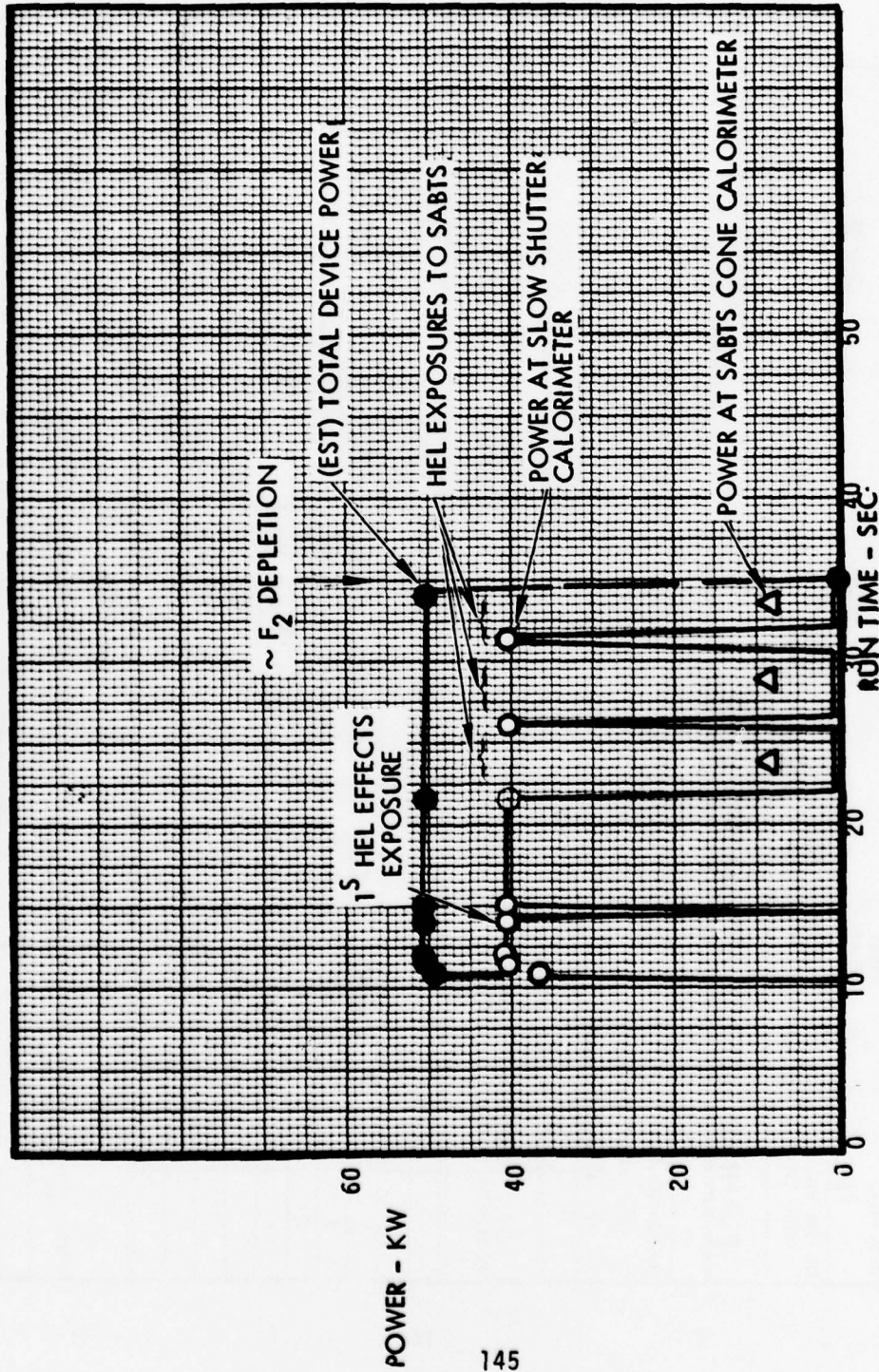


LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-276

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGH
2-18-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME							
VLI-276	SABOT	2-17-77	2221							
D2 FIRE VALVE OPEN (SEC)	10.4	D2 FIRE VALVE CLOSED (SEC)	35.0	LASING DURATION (SEC)	24.6	TOTAL COMPLETED TEST POSITIONS	3	PLANNED TOTAL PWR.	59	
PLANNED TEST NO. 0619/0A4 TIME LINES AS OF DATE 2-17-77 REVISION A										
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		CONFIGURATION						
D. MULLEN		1.7		REFLECTIVE						
R. DELYER		10 KW/CM ²		TRANSMISSIVE						
PLANNED				ACTUAL						
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	PLEXI		1.0	6.5	14.00	13.5		56.9		
2										
3		DOF	4.0	1.60	21.50	19.7		57.1		
4		DOF	4.0	1.60	22.10					
5		PE	4.0	1.60	32.70					
6		PE	4.0	1.60	38.30					
		PLEXI	.10		43.90					
					44.00					
NOTE: DEVICES LOST				POWER	AT TWO SECONDS OF LIFE OF 3 RD SPECIMEN					
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		ON		O-GRAPH		MAN.	MAN.			
No. 2		"		SANGAMO No. 1		6.0	50.0			
No. 3		"		SANGAMO No. 2		N/A				
No. 4		"		SABTS SEQ.		21.5	44.0			
WIND TUNNEL		11.0	18.0	CALORIMETER (SABTS)		21.5	44.0			
SABTS INST.				CALORIMETER (SLOW SHUTTER)		10.0	14.0			
HIGH FLOW SOLAR		10.0	48.0	"		17.0	21.5			
EFFECTS MIRROR		END OF 1		"		44.0	48.0			

LASER PERFORMANCE ANALYSIS, RUN VLI-276

BEAM INTENSITY PROFILE

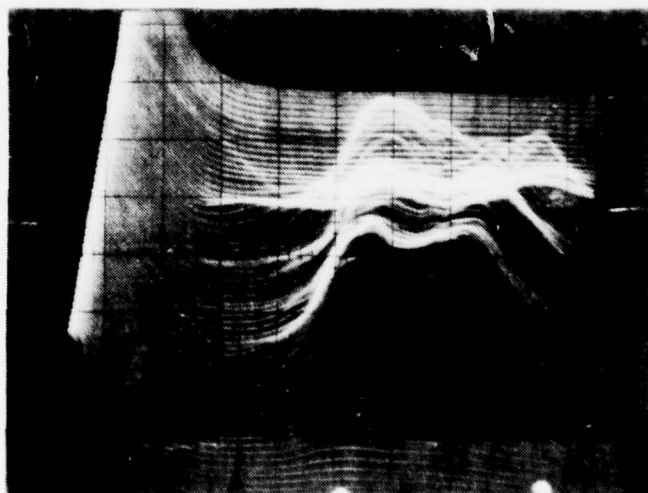
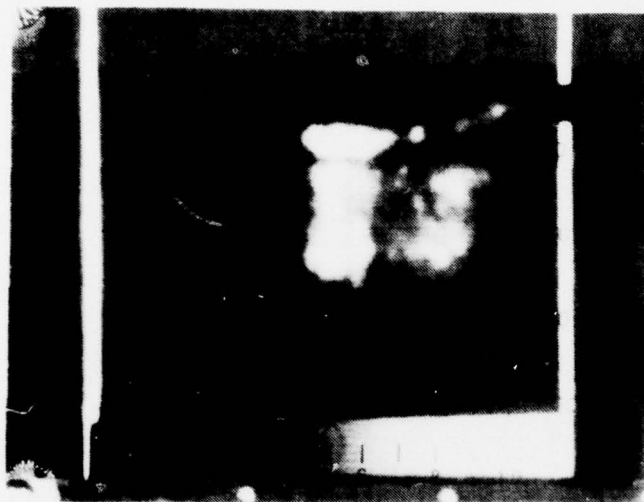
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) 20

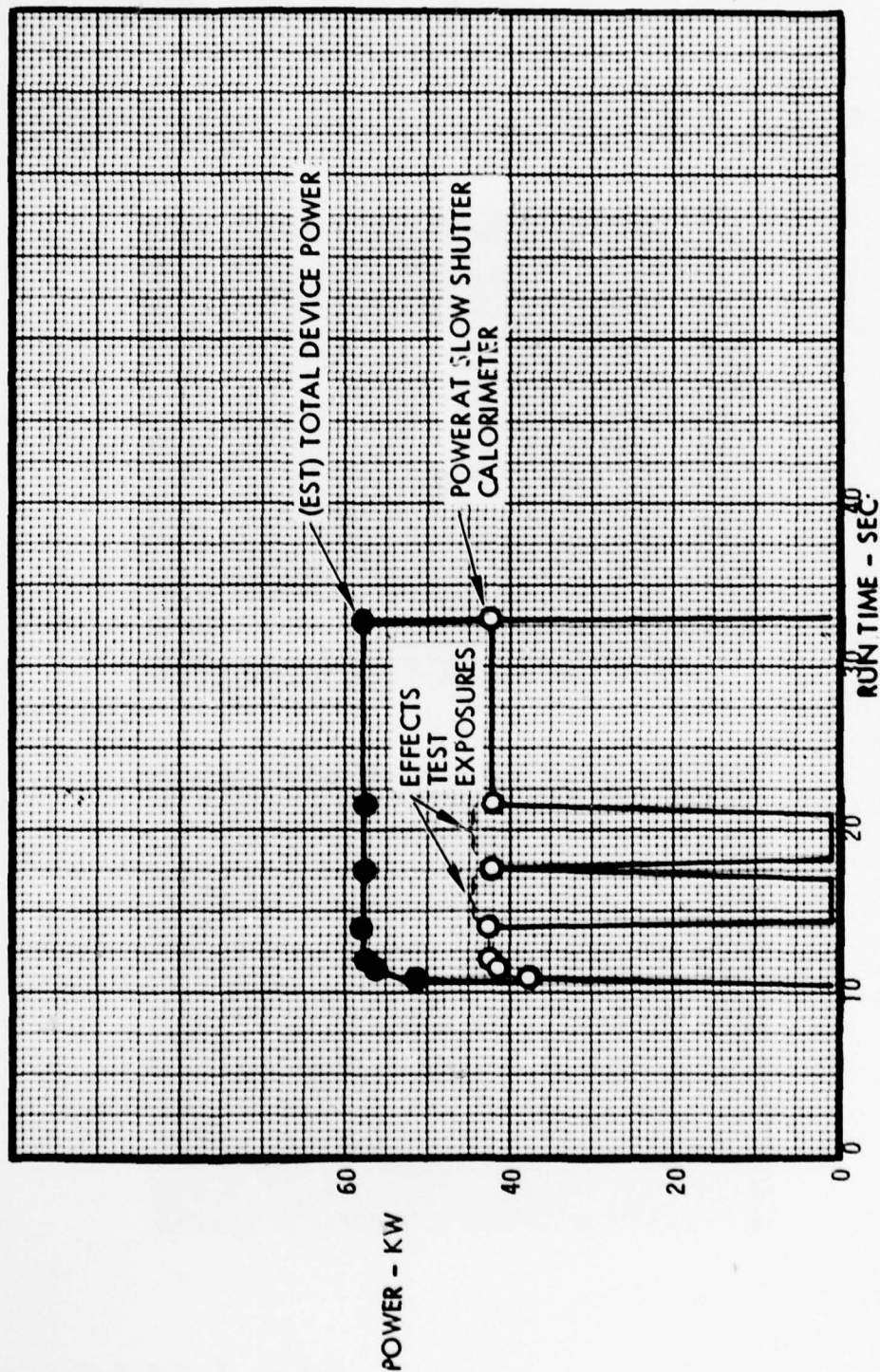


LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-277

ESTIMATED POWER VS. TIME



REMARKS: NO HEL SABTS EXPOSURE ACHIEVED ON THIS TEST.

PREPARED BY:

J. SINGS

2-22-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET										
QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME	TOTAL COMPLETED TEST POSITIONS	PLANNED TOTAL PWR.					
VLI-277	SABTS	2-22-77	2239		59					
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	LASING DURATION (SEC)								
10.4	33.0	22.6		2						
PLANNED TEST NO. GEI / SWI / SCSZ AS OF DATE 2-18-77 REVISION A										
EXPERIMENTER D. MULLEN R. DELYSER		PLANNED LINEAR MAGNIFICATION 1.7	CONFIGURATION <input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE							
		PLANNED PEAK PWR DENSITY 10 KW/CM ²								
PLANNED										
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	SWI		3.0	1.10	14.00	14.0		58.8		
2	SCSZ		3.0	4.0	18.10					
3										
4	* HIGHER DOF		4.0		25.10					
5					29.10					
6						31.4		58.6		
NOTES: FAST SHUTTER DID NOT RESET FOLLOWING PIGGYBACK EXPERIMENT. SABTS TEST ABORTED										
ITEM		START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)				
TV CAMERA No. 1		ON		O-GRAPH	MAN.	MAN.				
No. 2		"		SANGAMO No. 1	6.0	35.0				
No. 3		"		SANGAMO No. 2	N/A					
No. 4		"		SABTS SEQ.	N/A					
WIND TUNNEL		15.0	22.0	CALORIMETER (SABTS)	25.1	29.1				
GUILLIOTTINE		END OF 1		CALORIMETER (SLOW SHUTTER)	10.0	14.0				
EFFECTS MIRROR		END OF 2			21.1	25.1				
HI FLOW SOLENOID		21.0	33.0		29.1	33.0				

REF: TCR M421371

PAGE 3

OF 4

• LASER PERFORMANCE ANALYSIS, RUN VLI-277

BEAM INTENSITY PROFILE

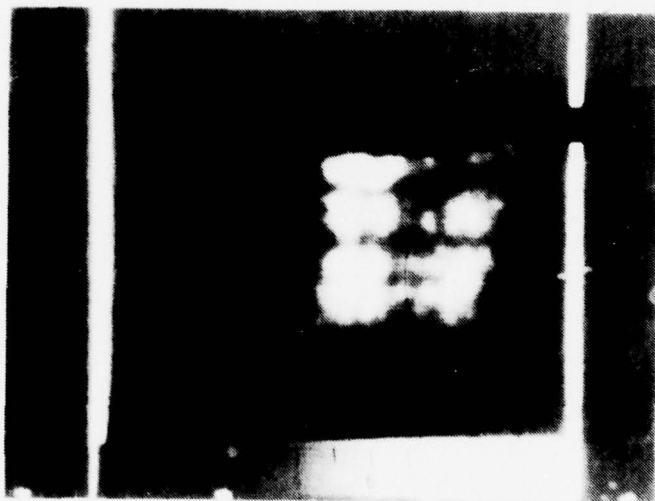
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

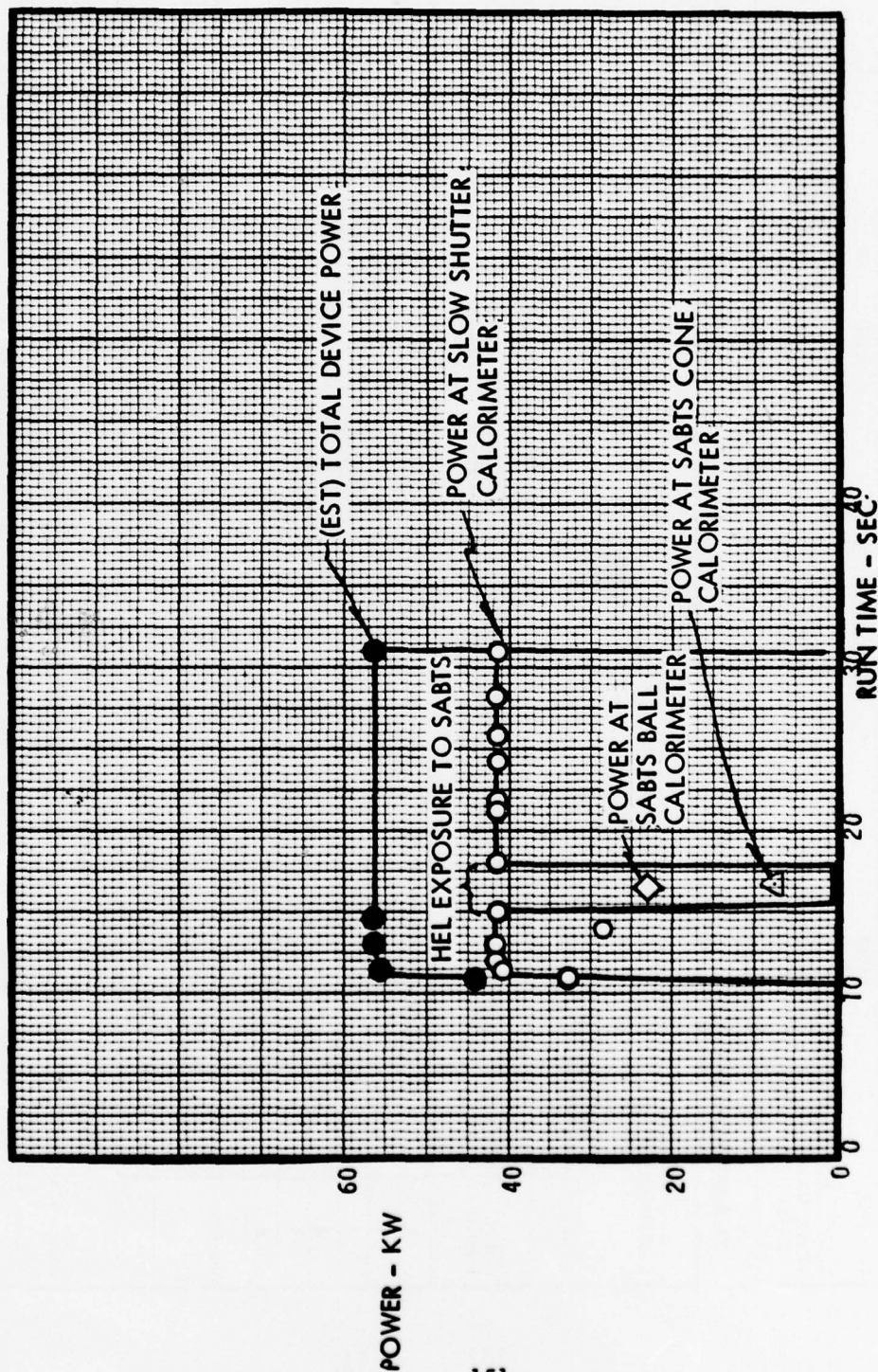
LINEAR PROFILE*

APPROX. TIME (SEC) N/A



LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-278

ESTIMATED POWER VS. TIME



REMARKS: NO EFFECTS TEST ATTEMPTED

PREPARED BY:

L. SINGH
2-23-77

LASER PERFORMANCE ANALYSIS, RUN VLI-278

BEAM INTENSITY PROFILE

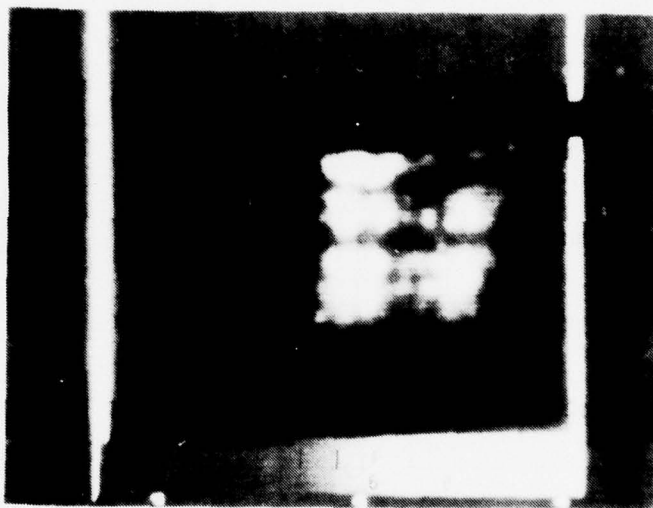
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) N/A

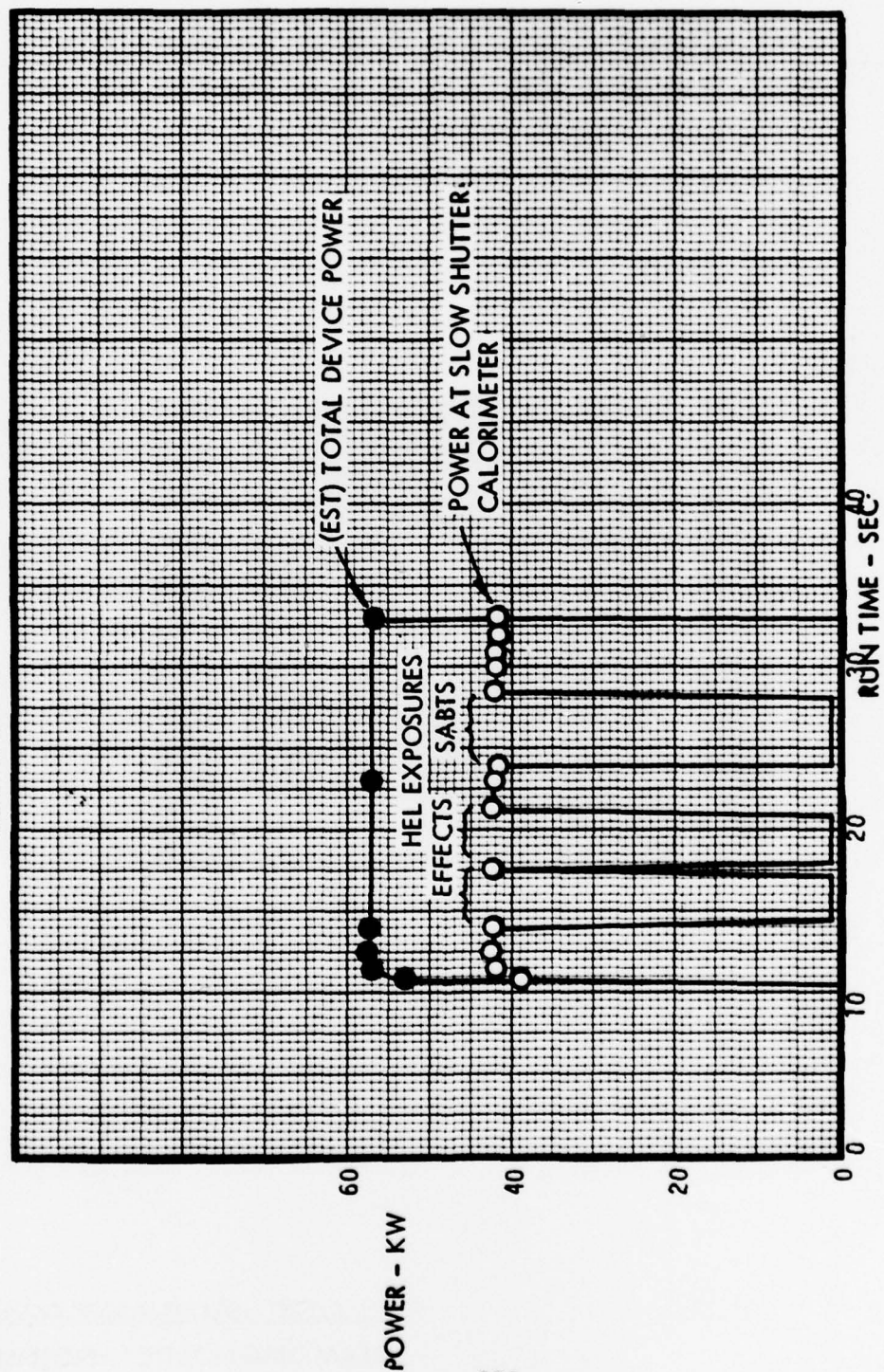


LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-279

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:
J. SINGS
 2-24-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

RUN NO.		TEST PLAN		DATE	TIME	PLANNED TOTAL PWR.
VL1-279		SABTS		2-24-77	1930	
D2 FIRE VALVE OPEN (SEC)	9.9	D2 FIRE VALVE CLOSED (SEC)	33.0	LASING DURATION (SEC)	23.1	TOTAL COMPLETED TEST POSITIONS
						3
						59

PLANNED TEST NO. GE 2 SW2/SCS2 TIME LINES AS OF DATE 2-25-77 REVISION 01/14

EXPERIMENTER	PLANNED LINEAR MAGNIFICATION	1.7	CONFIGURATION <input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE
	PLANNED PEAK PWR DENSITY	10 KW/CM ²	

TEST POSITION	PLANNED				ACTUAL				COMMENTS
	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER
1	SW2	0160	3.0	1.10	14.00	13.0		58.6	
2	SCS3		3.0	4.0	18.10				
3									
4	# HUGHES/DOF		4.0		25.10	23.2		58.0	
5					29.10				
6						32.5		57.8	

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH	MAN.	MAN.
No. 2	1.		SANGAMO No. 1	6.0	35.0
No. 3	"		SANGAMO No. 2	N/A	
No. 4	"		SABTS SEQ.	N/A	
WIND TUNNEL	15.0	22.0	CALORIMETER (SABTS)	25.1	29.1
GUILLOTINE	END OF 1		CALORIMETER (SLOW SHUTTER)	10.0	14.0
EFFECTS MIRROR	END OF 2		" "	21.1	25.1
HI FLOW SOLENOID	21.0	33.0	" "	29.1	33.0

* PROMILER

LASER PERFORMANCE ANALYSIS, RUN VLI-279

BEAM INTENSITY PROFILE

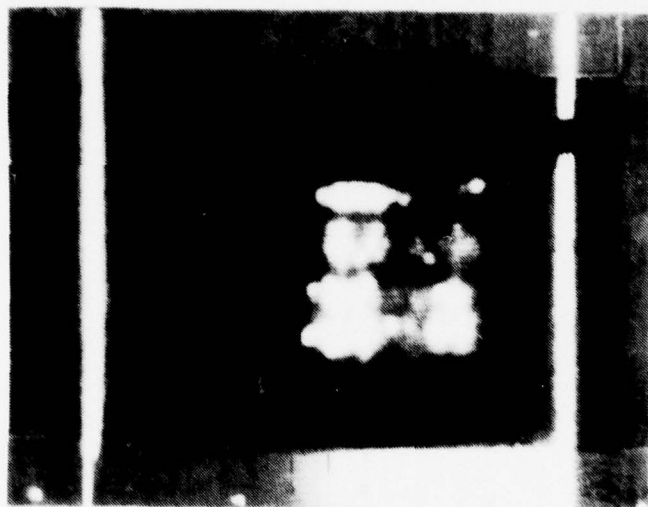
AS SEEN BY IR CAMERA VIEWING SECOND TURN PLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

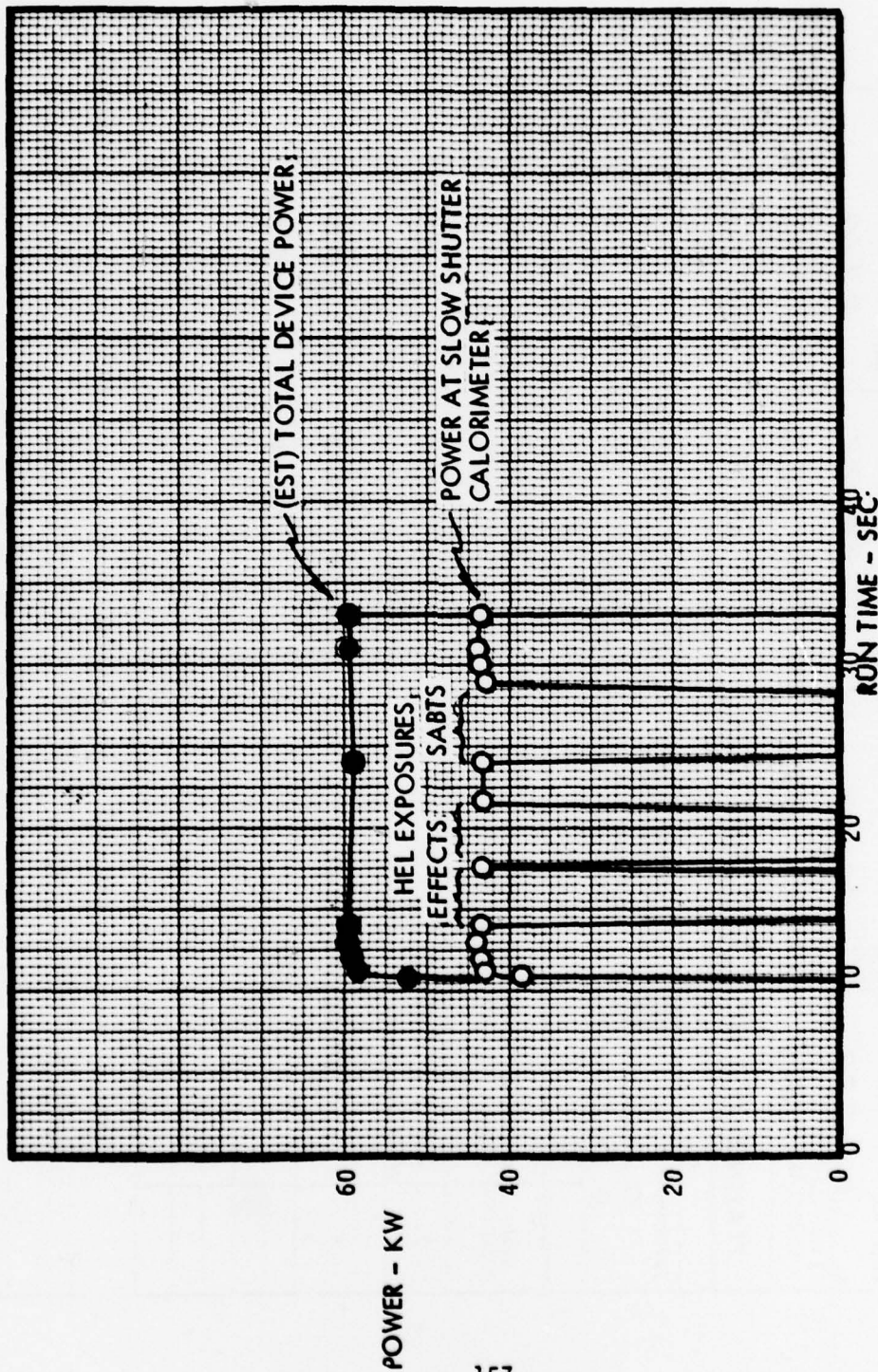
LINEAR PROFILE*

APPROX. TIME (SEC) N/A



LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-280

ESTIMATED POWER VS. TIME



PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA				
TEST PLAN	DATE	TIME	PLANNED TOTAL PWR.	
YLI-280	2-24-77	2210	59	
D2 FIRE VALVE OPEN (SEC)	33.0	22.6	3	
PLANNED TEST NO. <u>GE3</u> TIME LINES AS OF DATE <u>2-23-77</u> REVISION <u>OR16</u>				

EXPERIMENTER	PLANNED LINEAR MAGNIFICATION	PLANNED PEAK PWR DENSITY	CONFIGURATION	
			REFLECTIVE	TRANSMISSIVE
D. MULLER	2.7	30 KW/CM ²	<input checked="" type="checkbox"/>	<input type="checkbox"/>
R. DELVIER				

TEST POSITION	PLANNED				ACTUAL				COMMENTS
	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	
1.	SW 3	9753	3.0	1.10	14.00	14.0		59.5	
2	HSS 3		3.0	4.0	18.10				
3									
4	#	HSS/DSE	4.0		25.10	23.8		59.7	
5					29.10				
6						31.4		59.7	

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH	MAN.	MAN.
No. 2	"		SANGAMO No. 1	6.0	35.0
No. 3	"		SANGAMO No. 2	N/A	
No. 4	"		SABIS SEC.	N/A	
WIND TUNNEL	15.0	22.0	CALORIMETER (SABIS)	25.1	29.1
GUILLOTINE	END OF 1		CALORIMETER (SLOW SHUTTER)	10.0	14.0
EFFECTS MIRROR	END OF 2		"	21.1	25.1
HI FLOW SOLANOID	21.0	33.0	"	29.1	33.0

LASER PERFORMANCE ANALYSIS, RUN VLI-280

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURBINE FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

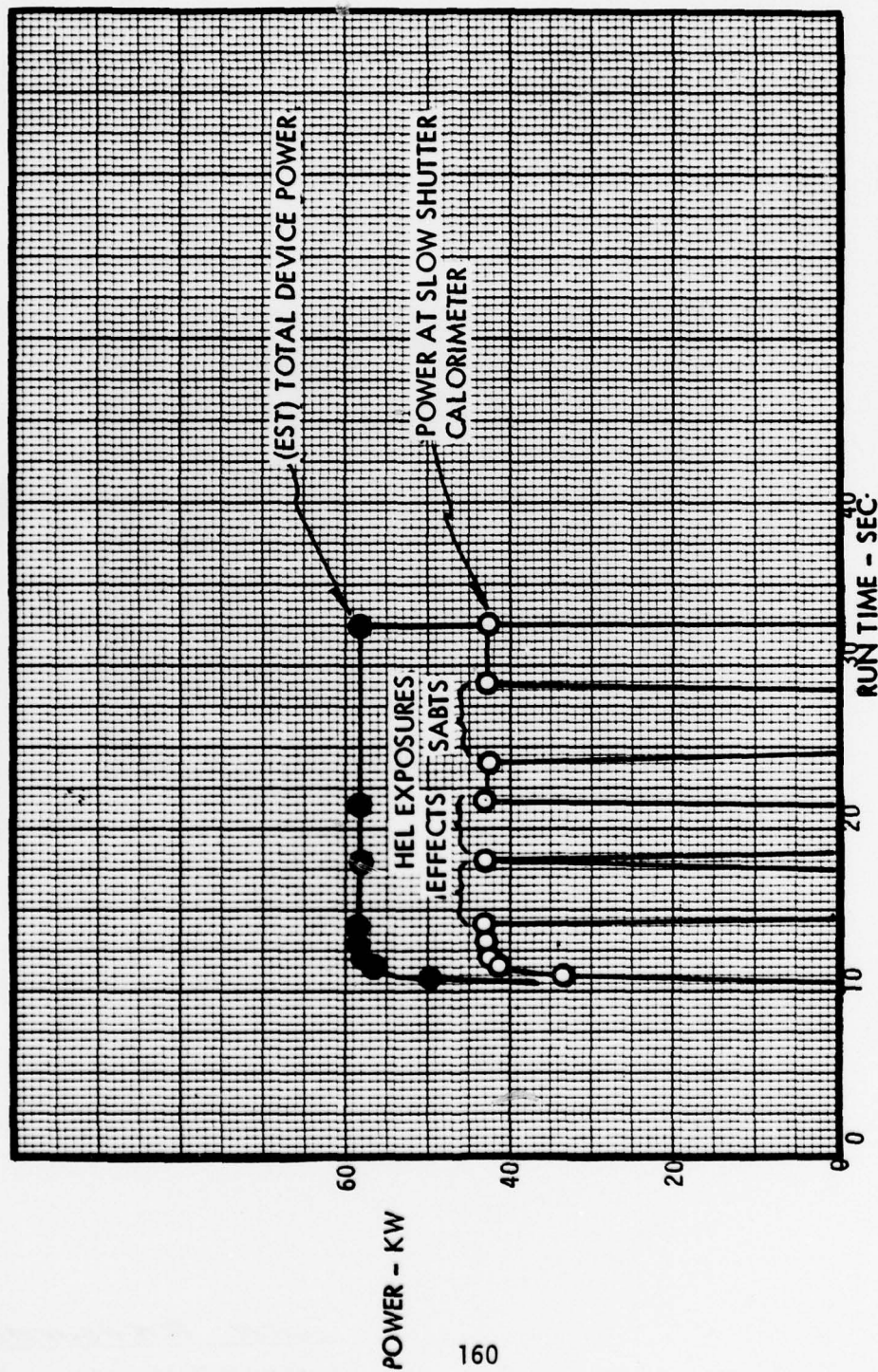
APPROX. TIME (SEC) N/A



LIEK BERGARSON

BEAM DIAGNOSTICS ENGINEER

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGS
2-25-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA																																																																																																									
RUN NO.	TEST PLAN	DATE	TIME	PLANNED TIME LINES		AS OF		DATE 2-23-77 REVISION 0016																																																																																																	
VLI-281		SABTS		2-25-77	0039																																																																																																				
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	PLANNED PEAK PWR DENSITY	PLANNED LINEAR MAGNIFICATION	PLANNED PEAK PWR DENSITY	PLANNED LINEAR MAGNIFICATION	PLANNED PEAK PWR DENSITY	PLANNED LINEAR MAGNIFICATION	PLANNED PEAK PWR DENSITY	PLANNED LINEAR MAGNIFICATION																																																																																																
9.9	32.5	30 KW/CM ²	2.7	30 KW/CM ²	2.7	30 KW/CM ²	2.7	30 KW/CM ²	2.7																																																																																																
<table border="1"> <thead> <tr> <th colspan="2">EXPERIMENTER</th> <th colspan="2">D. MULLAN</th> <th colspan="2">R. DALYDOR</th> <th colspan="2">CONFIGURATION</th> <th colspan="2">REFLECTIVE</th> <th colspan="2">TRANSMISSIVE</th> </tr> </thead> <tbody> <tr> <td>TEST POSITION</td> <td>SPECIMEN NO.</td> <td>COATING DESIGN</td> <td>EXPOSURE TIME (SEC)</td> <td>TRANSIT TIME (POST EXPOSURE)</td> <td>TIME FROM F₂</td> <td>TIME SUCCL</td> <td>EST. PWR. AT TARGET</td> <td>TOTAL POWER</td> <td>ACTUAL SPOT DIAMETER</td> <td>COMMENTS</td> <td></td> </tr> <tr> <td>1.</td> <td>SW4</td> <td>9753</td> <td>3.0</td> <td>1.10</td> <td>14.00</td> <td>14.0</td> <td></td> <td>59.2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2.</td> <td>HSS4</td> <td></td> <td>3.0</td> <td>4.0</td> <td>18.10</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4.</td> <td>HUGHES/DOF</td> <td></td> <td>4.0</td> <td></td> <td>25.10</td> <td>23.8</td> <td></td> <td>58.6</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5.</td> <td></td> <td></td> <td></td> <td></td> <td>29.10</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>31.4</td> <td></td> <td>58.8</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										EXPERIMENTER		D. MULLAN		R. DALYDOR		CONFIGURATION		REFLECTIVE		TRANSMISSIVE		TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SUCCL	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS		1.	SW4	9753	3.0	1.10	14.00	14.0		59.2				2.	HSS4		3.0	4.0	18.10							3.												4.	HUGHES/DOF		4.0		25.10	23.8		58.6				5.					29.10							6.						31.4		58.8			
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GUILLOTINE	END OF 1			CALORIMETER (SLOW SHUTTER)	10.0	14.0																																																																																																			
EFFECTY MIRROR	END OF 2			"	21.1	25.1																																																																																																			
HL FLOW POLAROID	21.0	33.0		"	29.1	33.0																																																																																																			

LASER PERFORMANCE ANALYSIS, RUN VLI-581

BEAM INTENSITY PROFILE

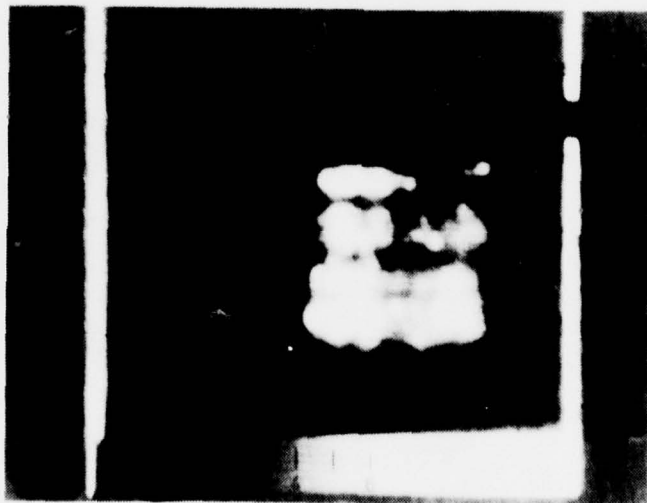
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) N/A

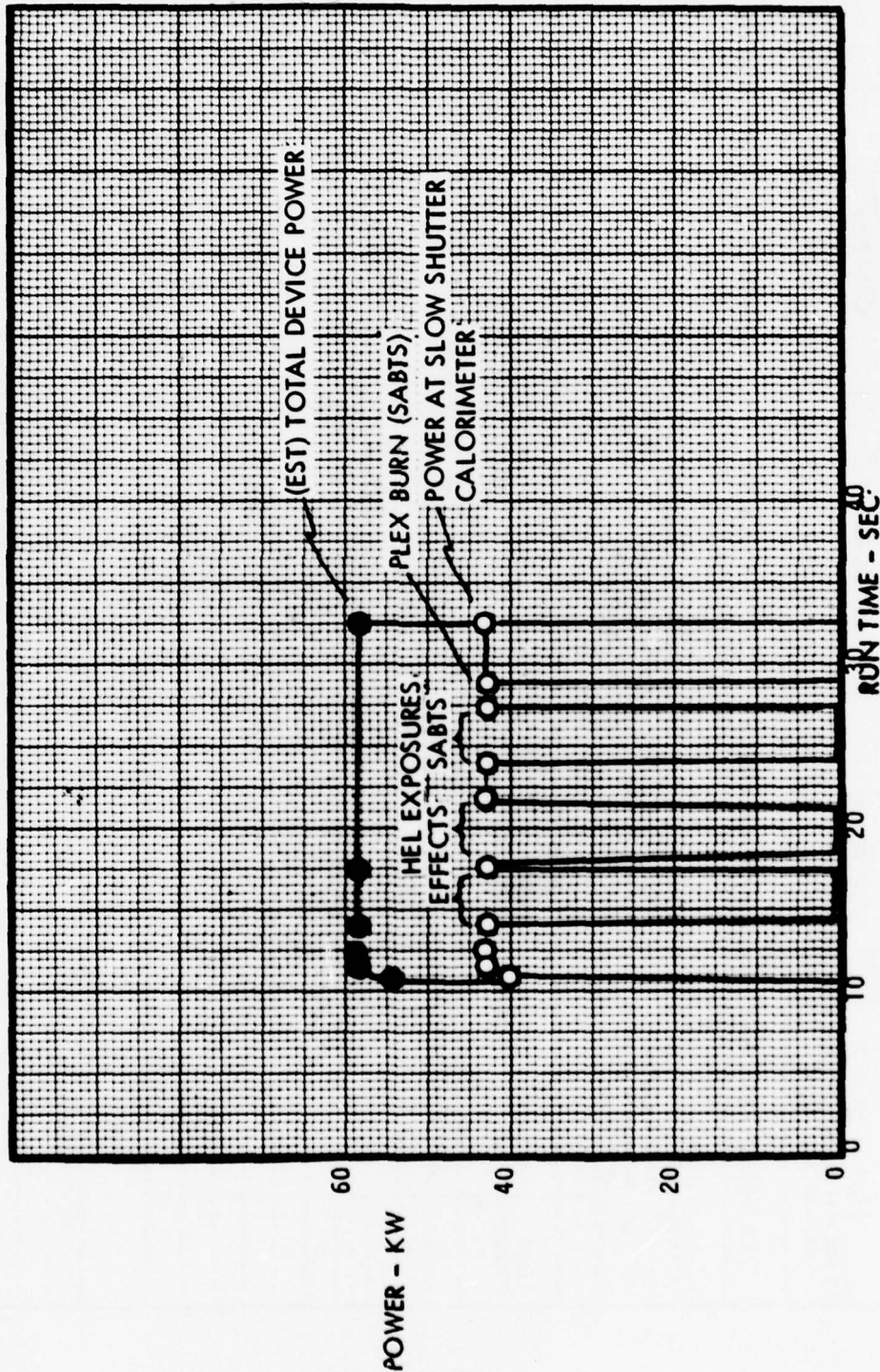


LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-282

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. S. NG
2-26-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME	PLANNED TEST NO. SWS/MR/ TIME LINES		AS OF		DATE 2-25-77 REVISION		
VLI - 282	SABTS	2-26-77	0047	685				0016		
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	32.5	LASING DURATION (SEC)	22.6	TOTAL COMPLETED TEST POSITIONS	4	PLANNED TOTAL PWR.	59		
<div> <div> EXPERIMENTER D. MULLEN J. HARRIS J. EVANS </div> <div> PLANNED LINEAR MAGNIFICATION 1.7 PLANNED PEAK PWR DENSITY 10 KW/CM² </div> <div> CONFIGURATION <input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE </div> </div>										
PLANNED				ACTUAL						
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	SWS	0160	3.0	1.10	14.00	13.0		57.5		
2	SHR1		2.0	4.00	18.10					
3						23.2		59.3		
4	PE/PE		4.0	1.10	24.10					
5	PLEX1		0.1		29.20					
6					29.30	31.9		59.3		
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		ON		O-GRAPH		MAN.	MAN.			
No. 2		"		SANGAMO No. 1		6.0	34.0			
No. 3		"		SANGAMO No. 2		N/A				
No. 4		"		SABTS SEQ.		N/A				
GUILLOTINE		END OF 1		CALORIMETER (SABTS)		24.1	28.1			
SABTS INST.				CALORIMETER (SLOW SHUTTER)		10.0	14.0			
EFFECTIVE MIRROR		END OF 2				20.1	24.1			
HI FLOW SOLENOID		21.0	32.0			27.3	33.0			

LASER PERFORMANCE ANALYSIS, RUN VLI-282

BEAM INTENSITY PROFILE

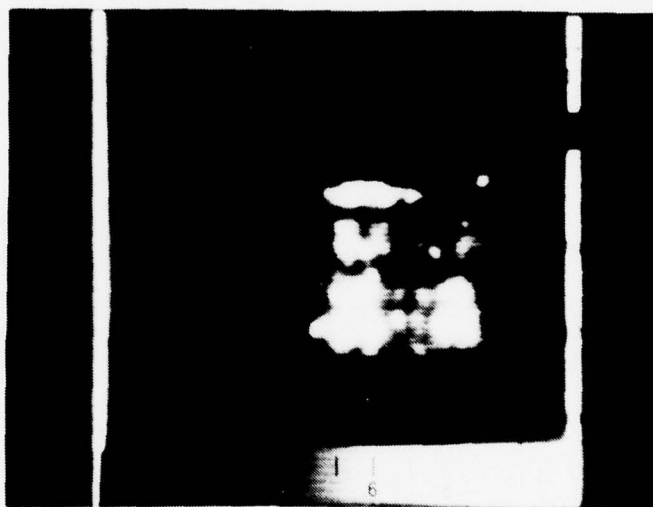
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

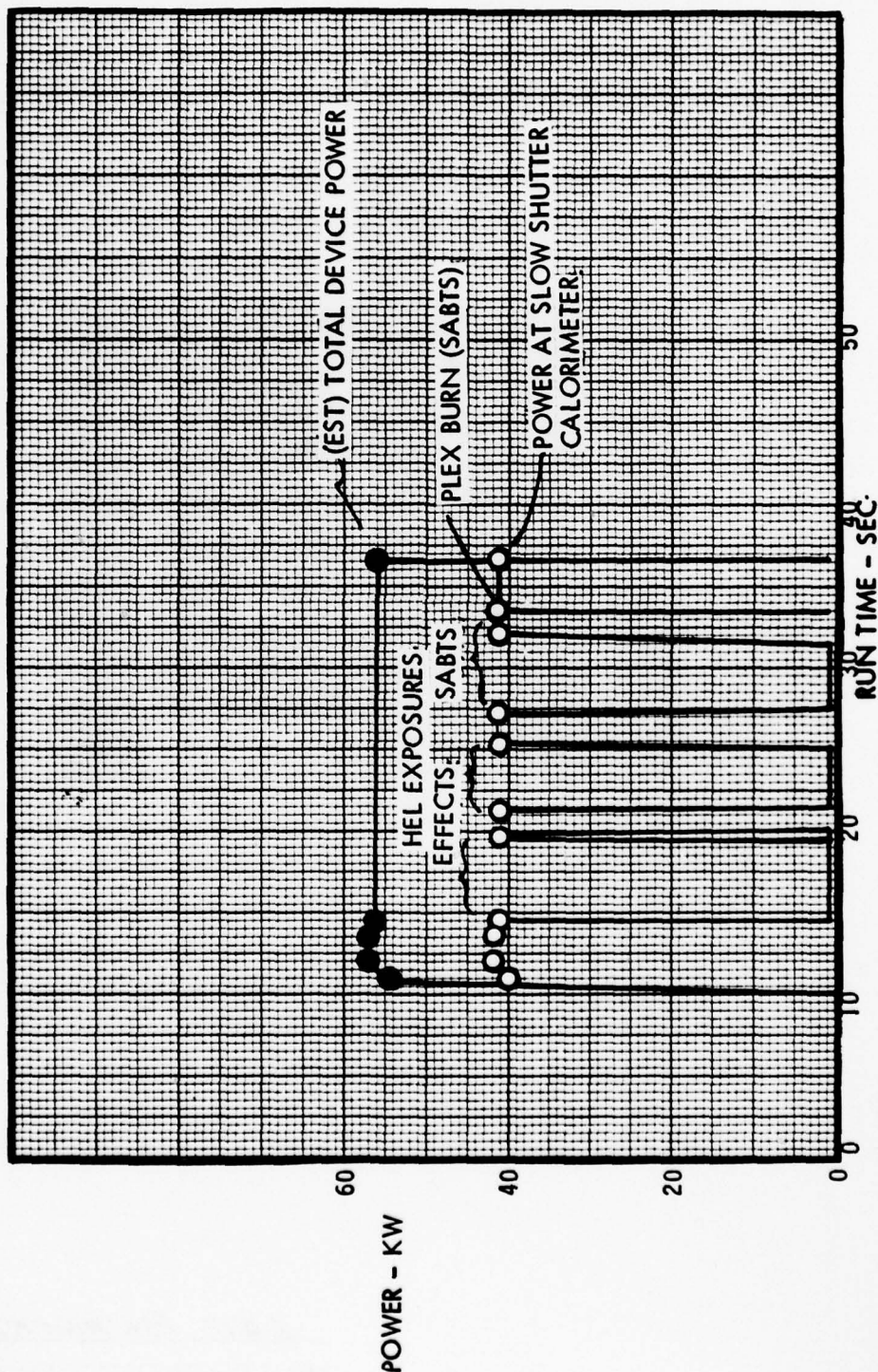
APPROX. TIME (SEC) N/A



LEE BERGERION

BEAM DIAGNOSTICS ENGINEER

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGH

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME							
VLI-283	SABTS	2-26-77	2148							
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	36.6	LASING DURATION (SEC)	26.7	TOTAL COMPLETED TEST POSITIONS	4	PLANNED TOTAL PWR.	57		
PLANNED TEST NO. <u>606</u> TIME LINES AS OF DATE <u>2-26-77</u> REVISION <u>5</u>										
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		CONFIGURATION						
D. MULLEN		2.7		<input checked="" type="checkbox"/> REFLECTIVE						
P. RAGLIN		30 KW/CM ²		<input type="checkbox"/> TRANSMISSIVE						
PLANNED				ACTUAL						
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1.	SHR 2		4.0	1.10	14.00	13.5		57.9		
2	HAUK 1		5.0	4.00	19.10					
3						27.3		57.0		
4	* HUGHES/DNF		4.0	1.10	28.10					
5	PLEX 1		0.1		33.20					
6					33.30					
						36.0		57.2		
ITEM		START (SEC)	STOP (SEC)	ITEM		START (SEC)	STOP (SEC)			
TV CAMERA No. 1		ON		O-GRAPH		MAN.	MAN.			
No. 2		"		SANGAMO No. 1		6.0	39.0			
No. 3		"		SANGAMO No. 2		N/A				
No. 4		"		SABTS SEQ.		N/A				
GUILLOTINE		END OF 1		CALORIMETER (SABTS)		28.10	33.20			
SABTS INST.				CALORIMETER (SLOW SHUTTER)		10.0	14.0			
EFFECTS MIRROR		END OF 2		"		24.1	28.1			
HI FLOW SOLAROID		21.0		"		32.3	37.0			

REF: TCR ML 21372 PAGE 3 OF 4

LASER PERFORMANCE ANALYSIS, RUN VLI-283

BEAM INTENSITY PROFILE

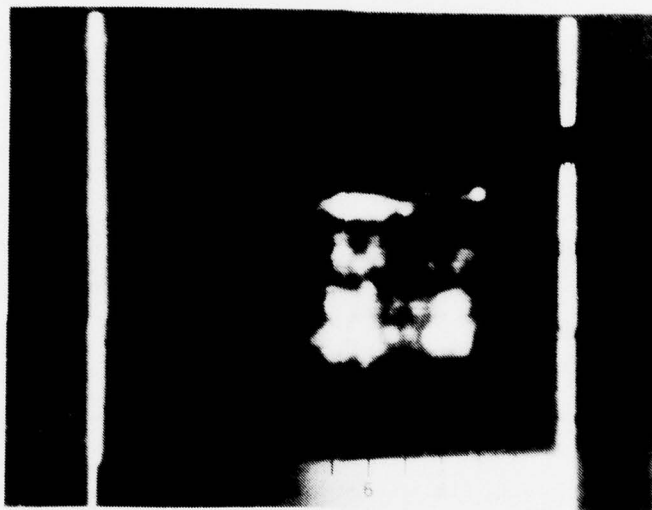
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) N/A

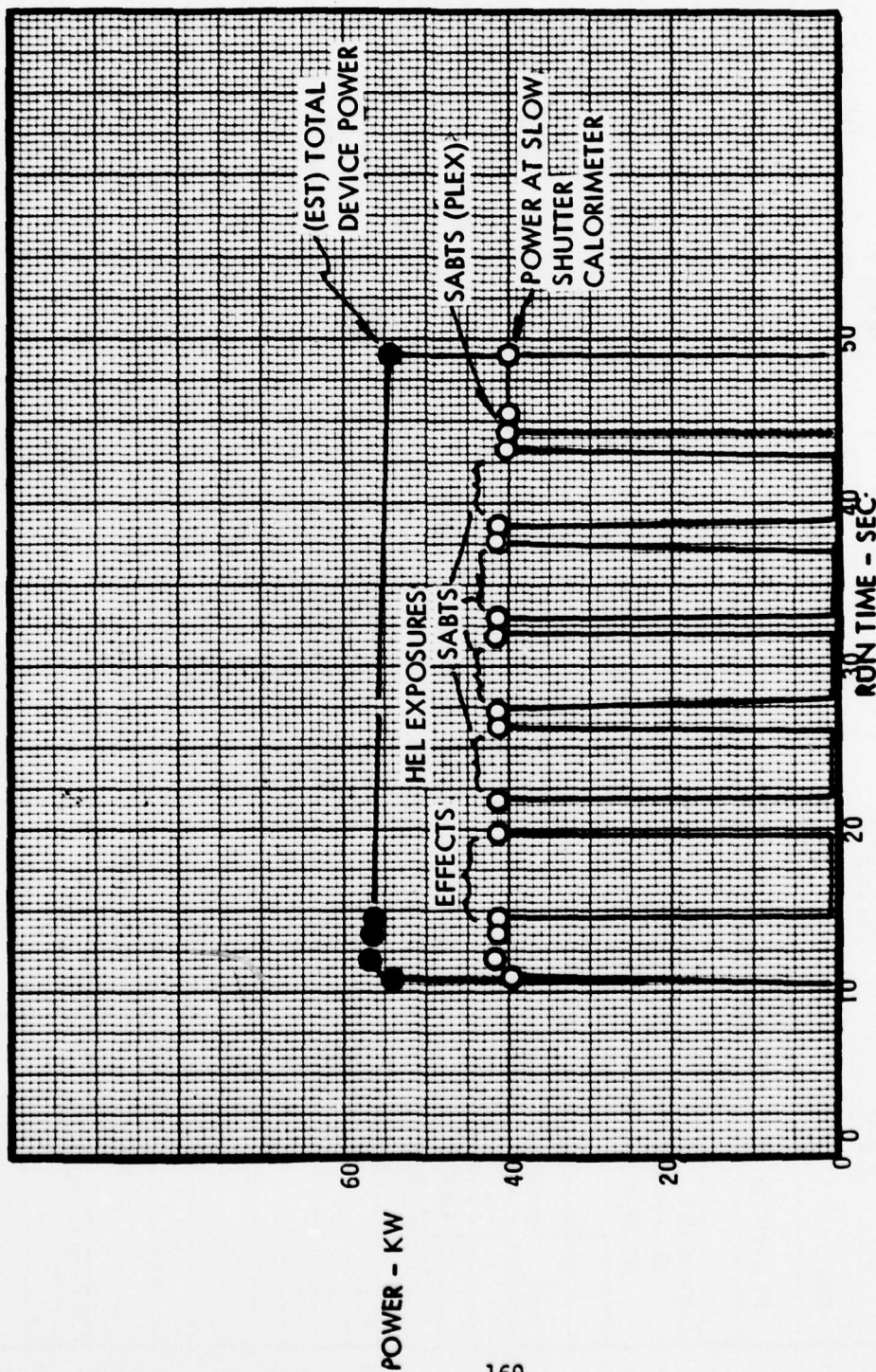


LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-284

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

L. Stalges

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA																																																																																																																																																					
RUN NO.	TEST PLAN	DATE	TIME	PLANNED TEST NO. <i>657</i>		AS OF		DATE <i>2-26-77</i> REVISION <i>B</i>																																																																																																																																													
<i>VLI-284</i>	<i>SABITS</i>	<i>2-27-77</i>	<i>0001</i>	<i>657</i>		<i>AS OF</i>		<i>DATE 2-26-77 REVISION B</i>																																																																																																																																													
D2 FIRE VALVE OPEN (SEC)	D2 FIRE VALVE CLOSED (SEC)	LASING DURATION (SEC)	TOTAL COMPLETED TEST POSITIONS	PLANNED TEST NO. <i>657</i>		AS OF		DATE <i>2-26-77</i> REVISION <i>B</i>																																																																																																																																													
<i>9.9</i>	<i>49.0</i>	<i>40.9</i>	<i>7</i>	<i>657</i>		<i>AS OF</i>		<i>DATE 2-26-77 REVISION B</i>																																																																																																																																													
<table border="1"> <thead> <tr> <th colspan="2">EXPERIMENTER</th> <th colspan="2">PLANNED LINEAR MAGNIFICATION</th> <th colspan="2">CONFIGURATION</th> <th colspan="2">PLANNED</th> <th colspan="2">ACTUAL</th> </tr> <tr> <th colspan="2"><i>D. MULLAN</i></th> <th colspan="2"><i>2.7</i></th> <th colspan="2"><input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE</th> <th colspan="2"></th> <th colspan="2"></th> </tr> <tr> <th colspan="2"><i>P. RAGLIN</i></th> <th colspan="2"><i>30 KW/CM²</i></th> <th colspan="2"></th> <th colspan="2"></th> <th colspan="2"></th> </tr> <tr> <th>TEST POSITION</th> <th>SPECIMEN NO.</th> <th>COATING DESIGN</th> <th>EXPOSURE TIME (SEC)</th> <th>TRANSIT TIME (POST EXPOSURE)</th> <th>TIME FROM F₂</th> <th>TIME SLICE</th> <th>EST. PWR. AT TARGET</th> <th>TOTAL POWER</th> <th>ACTUAL SPOT DIAMETER</th> <th>COMMENTS</th> </tr> </thead> <tbody> <tr> <td><i>1</i></td> <td><i>EXR3</i></td> <td></td> <td><i>6.0</i></td> <td><i>1.10</i></td> <td><i>14.00</i></td> <td><i>13.0</i></td> <td></td> <td><i>57.6</i></td> <td></td> <td></td> </tr> <tr> <td><i>2</i></td> <td><i>ARPA1</i></td> <td></td> <td><i>3.0</i></td> <td><i>1.10</i></td> <td><i>21.10</i></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><i>3</i></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><i>4</i></td> <td><i>HVHRT/100</i></td> <td></td> <td><i>4.0</i></td> <td><i>1.70</i></td> <td><i>25.20</i></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><i>5</i></td> <td><i>"</i></td> <td></td> <td><i>4.0</i></td> <td><i>1.70</i></td> <td><i>30.90</i></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><i>6</i></td> <td><i>"</i></td> <td></td> <td><i>4.0</i></td> <td><i>1.70</i></td> <td><i>36.60</i></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td><i>"</i></td> <td></td> <td><i>4.0</i></td> <td><i>1.70</i></td> <td><i>42.30</i></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td><i>PLEX1</i></td> <td></td> <td><i>0.1</i></td> <td></td> <td><i>48.00</i></td> <td><i>47.8</i></td> <td></td> <td><i>56.9</i></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td><i>48.10</i></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		CONFIGURATION		PLANNED		ACTUAL		<i>D. MULLAN</i>		<i>2.7</i>		<input checked="" type="checkbox"/> REFLECTIVE <input type="checkbox"/> TRANSMISSIVE						<i>P. RAGLIN</i>		<i>30 KW/CM²</i>								TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS	<i>1</i>	<i>EXR3</i>		<i>6.0</i>	<i>1.10</i>	<i>14.00</i>	<i>13.0</i>		<i>57.6</i>			<i>2</i>	<i>ARPA1</i>		<i>3.0</i>	<i>1.10</i>	<i>21.10</i>						<i>3</i>											<i>4</i>	<i>HVHRT/100</i>		<i>4.0</i>	<i>1.70</i>	<i>25.20</i>						<i>5</i>	<i>"</i>		<i>4.0</i>	<i>1.70</i>	<i>30.90</i>						<i>6</i>	<i>"</i>		<i>4.0</i>	<i>1.70</i>	<i>36.60</i>							<i>"</i>		<i>4.0</i>	<i>1.70</i>	<i>42.30</i>							<i>PLEX1</i>		<i>0.1</i>		<i>48.00</i>	<i>47.8</i>		<i>56.9</i>								<i>48.10</i>					
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* PROFILER

REF: ICR *M421372*

PAGE *3* OF *4*

LASER PERFORMANCE ANALYSIS, RUN VLI-284

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) N/A

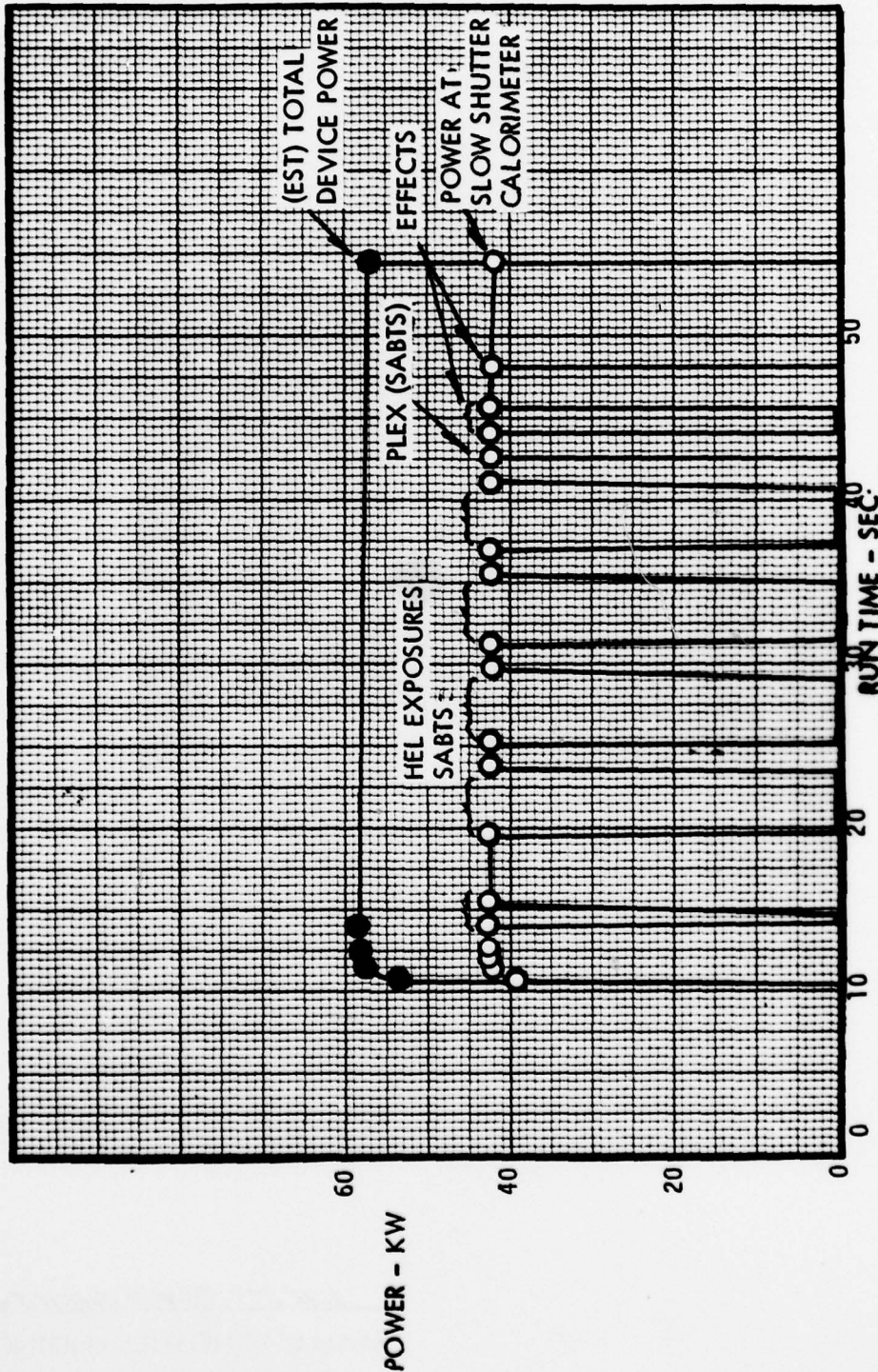


LEH BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-285

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. S. NG

3-1-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA										
RUN NO.	TEST PLAN	DATE	TIME	PLANNED TIME LINES		AS OF		DATE 2-28-77 REVISION A		
KL1-285	5A B T S	2-28-77	2147							
D2 FIRE VALVE OPEN (SEC)	10.4	D2 FIRE VALVE CLOSED (SEC)	54.5	LASING DURATION (SEC)	44.1	TOTAL COMPLETED TEST POSITIONS	8	PLANNED TOTAL PWR.	59	
PLANNED TEST NO. 0620/100 TIME LINES										
EXPERIMENTER		PLANNED LINEAR MAGNIFICATION		CONFIGURATION						
D. MULLER		3.1		REFLECTIVE						
		PLANNED PEAK PWR DENSITY		TRANSMISSIVE						
		≈ 25 kW/cm ²								
PLANNED										
TEST POSITION	SPECIMEN NO.	COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	COMMENTS
1	*	DOF 5	4.0	1.70	14.00	14.0		58.9		
2		DOF 6	4.0	1.70	19.70					
3		DOF 8	4.0	1.70	25.40					
4		HOUSE 107	4.0	1.70	31.10					
5	*	HOUSE 103	4.0	1.70	36.80					
6		PLEXI	0.1	1.10	42.50					
7										
8	ANT 1		3.0	1.10	43.70					
9	BALCAL		3.0		47.80					
10					50.90	54.5		57.9		
ACTUAL										
ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)	ITEM	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH			MAN.			MAN.	
No. 2	"		SANGAMO No. 1			6.0			57.0	
No. 3	"		SANGAMO No. 2			N/A				
No. 4	"		SABTS SEQ.			N/A				
GUILLOTINE	END OF 8		CALORIMETER (SABTS)			14.0			42.5	
SABTS INST.			CALORIMETER (SLOW SHUTTER)			10.0			14.0	
EFFECTS MIRROR	END OF 6		"			50.8			55.0	
HI FLOW SOLENOID	10.0	55.0	MOVIE CAMERA			42.0			55.0	

LASER PERFORMANCE ANALYSIS, RUN VLI-285

BEAM INTENSITY PROFILE

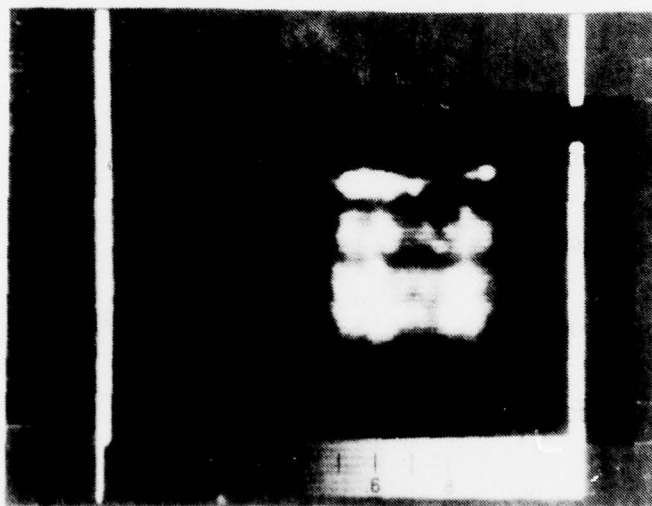
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

APPROX. TIME (SEC) N/A

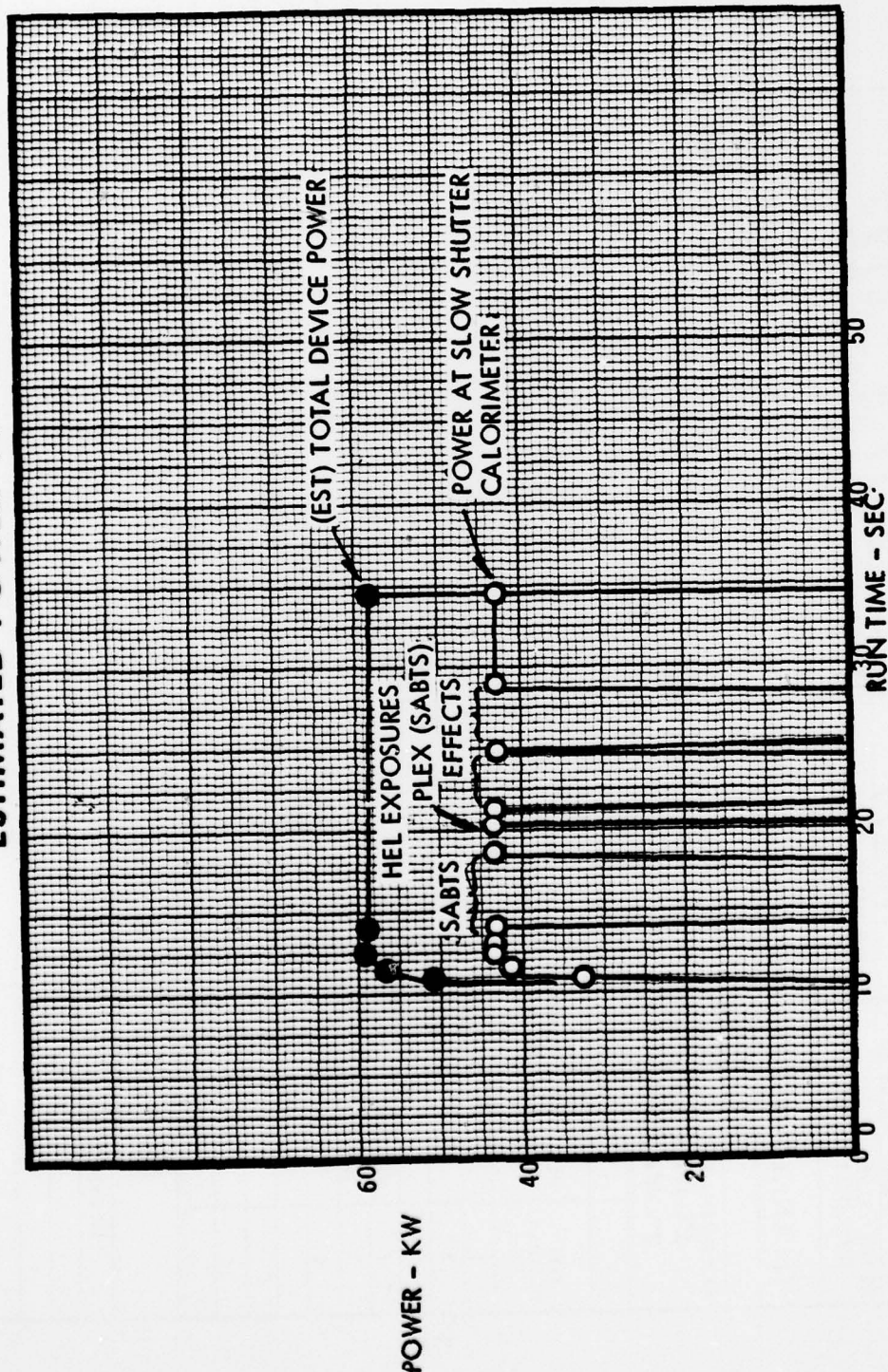


LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

LASER PERFORMANCE ANALYSIS - RUN NUMBER VL 1-286

ESTIMATED POWER VS. TIME



REMARKS:

PREPARED BY:

J. SINGS
3-2-77

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA	
TEST PLAIN	DATE
VLI-286	2-28-77
TIME	2333
D2 FIRE VALVE OPEN (SEC)	9.9
L2 FIRE VALVE CLOSED (SEC)	34.5
LASTING DURATION (SEC)	24.6
TOTAL COMPLETED TEST POSITIONS	4
PLANNED TOTAL PWR.	59

PLANNED TEST NO. 0E21/NG/ TIME LINES AS OF DATE 2-28-77 REVISION 0E15

EXPERIMENTER	PLANNED LINEAR MAGNIFICATION	CONFIGURATION
D. MULLON	3.1	<input checked="" type="checkbox"/> REFLECTIVE
T. ROZSMART	PLANNED PEAK PWR DENSITY $\approx 25 \text{ KW/CM}^2$	<input type="checkbox"/> TRANSMISSIVE

TEST POSITION	SPECIMEN NO.	COATING DESIGN	PLANNED				ACTUAL				COMMENTS
			EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM F ₂	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER		
1	*	HUGHES	4.0	1.70	14.00	13.5		59.7			
2		PLEXI	0.1	4.00	19.70						
3											
4	SPAWI		3.0	1.10	23.80						
5	NGI	45° TEST	3.0		27.90						
6					30.90	33.5		59.3			

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPI	MAN.	MAN.
No. 2	"		SANGAMO No. 1	6.0	37.0
No. 3	"		MOVIE CAMERA	23.0	35.0
No. 4	"		SABTS SEQ.	N/A	
GULLOTTINE	END OF 4		CALORIMETER (SABTS)	14.0	19.7
SABTS INST.			CALORIMETER (SLOW SHUTTER)	10.0	14.0
EFFECT MIRROR	END OF 2		"	19.8	23.8
HI FLOW ISLAND	10.0	25.0	"	30.9	35.0

* PROFILE REF: ICR M121373 PAGE 3 OF 4

LASER PERFORMANCE ANALYSIS, RUN VLI-286

BEAM INTENSITY PROFILE

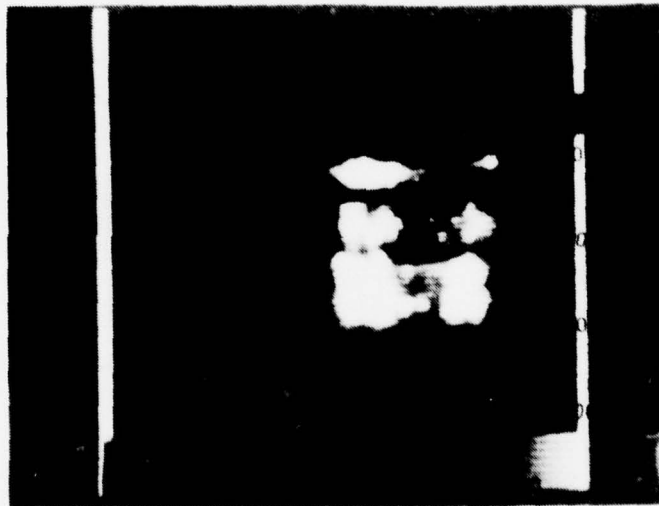
AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) 20

LINEAR PROFILE*

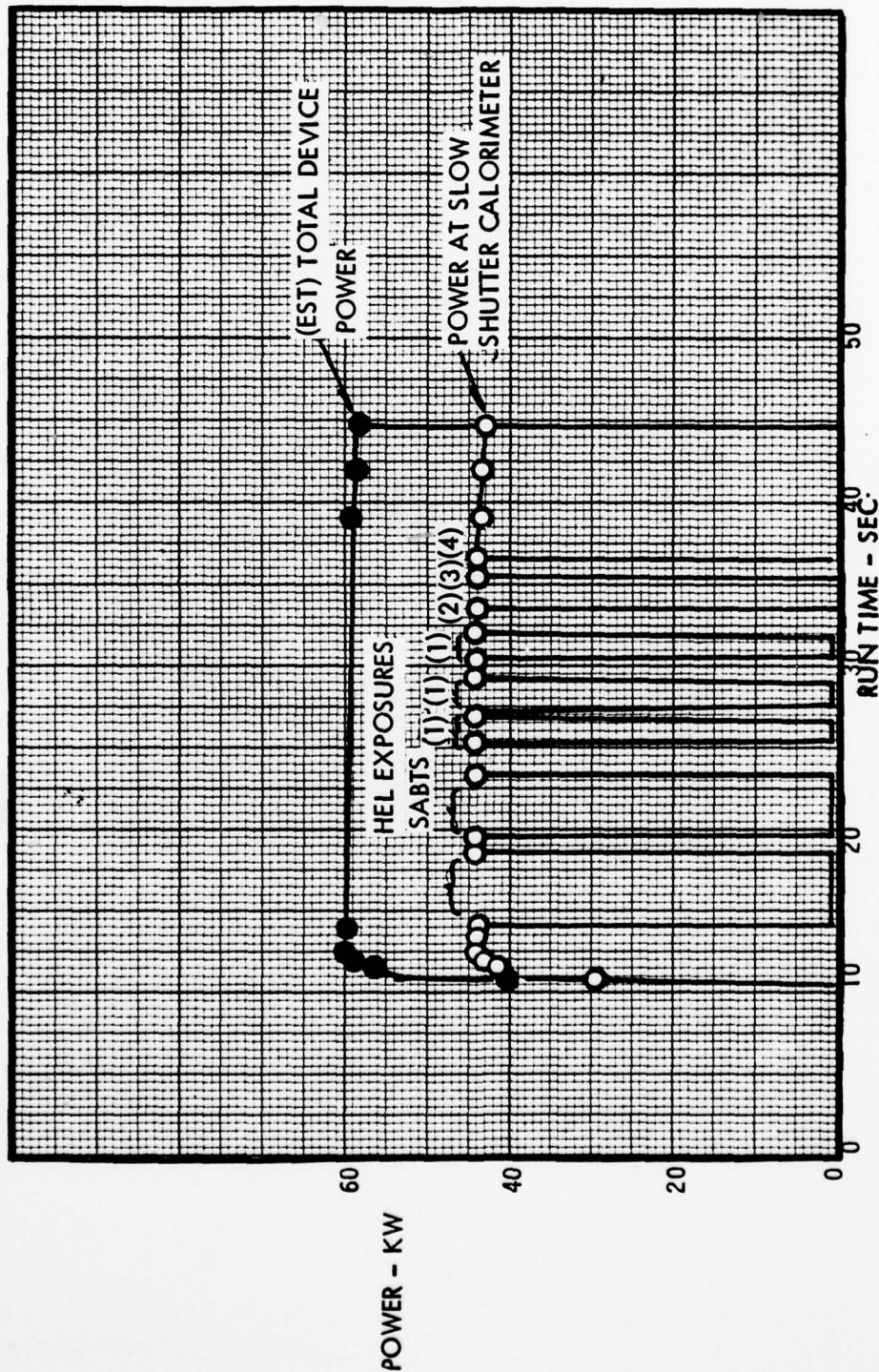
APPROX. TIME (SEC) N/A



LEE BERGERSON

BEAM DIAGNOSTICS ENGINEER

ESTIMATED POWER VS. TIME



REMARKS: (1) SABTS OVERRIDE

(2) SABTS PLEX BURN

(3) EFFECTS EXPOSURE BALL CAL

(4) EFFECTS EXPOSURE NC2

PREPARED BY:

J. SINGS

PLANNED TIME LINES AND QUICK LOOK DATA SHEET

QUICK LOOK TEST DATA	
RUN NO. VL-287	TEST PLAN SABTS
D2 FIRE VALVE OPEN (SEC) 9.9	D2 FIRE VALVE CLOSED (SEC) 44.7
DATE 3-1-77	TIME 0224
LASING DURATION (SEC) 34.8	TOTAL COMPLETED TEST POSITIONS 59
PLANNED TEST NO. 0E22/MG TIME LINES AS OF DATE 2-28-77 REVISION 0R16	

EXPERIMENTER D. MULLEN	PLANNED LINEAR MAGNIFICATION 3.1	CONFIGURATION <input checked="" type="checkbox"/> REFLECTIVE <input checked="" type="checkbox"/> TRANSMISSIVE
PLANNED PEAK PWR DENSITY ~ 25 KW/CM²		

TEST POSITION	SPECIMEN NO.	PLANNED				ACTUAL				COMMENTS
		COATING DESIGN	EXPOSURE TIME (SEC)	TRANSIT TIME (POST EXPOSURE)	TIME FROM f_2	TIME SLICE	EST. PWR. AT TARGET	TOTAL POWER	ACTUAL SPOT DIAMETER	
1.	*	DOF 6 (R)	4.0	1.70	14.00	13.5		60.0		
2.		DOF 5 (R)	4.0	1.70	19.70					
3		ZnSe 30 (T)	4.0	1.70	25.40					
4		SrF380 (T)	4.0	1.70	31.10					
5	*	OCL1 23 (T)	4.0	1.70	36.80					
6		PLATE	0.1	1.10	42.50					
7						43.2		59.1		
8	BALCON		3.0	1.10	43.70					
9	NG 1	45° TEST	3.0		47.80					
10					50.80					

ITEM	START (SEC)	STOP (SEC)	ITEM	START (SEC)	STOP (SEC)
TV CAMERA No. 1	ON		O-GRAPH	MAN.	MAN.
No. 2	"		SANGAMO No. 1	6.0	52.0
No. 3	"		SANGAMO No. 2	N/A	
No. 4	"		SABTS SEQ.	N/A	
GUILLOTINE	END OF 8		CALORIMETER (SABTS)	14.0	42.5
SABTS INST.			CALORIMETER (SLOW SHUTTER)	10.0	14.0
REFLECT MIRROR	END OF 6		"	50.8	55.0
HI FLOW SOLANOID	10.0	55.0	MAVIE CAMERA	42.0	55.0

LASER PERFORMANCE ANALYSIS, RUN VLI-227

BEAM INTENSITY PROFILE

AS SEEN BY IR CAMERA VIEWING SECOND TURN FLAT

TOTAL INTENSITY

APPROX. TIME (SEC) N/A

LINEAR PROFILE*

APPROX. TIME (SEC) N/A

NO DATA - BDL TIMER TIMED OUT
DIGITAL RECORDER